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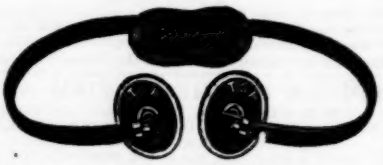

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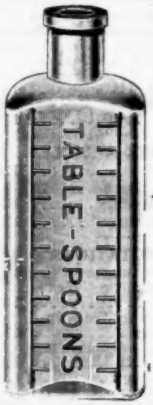

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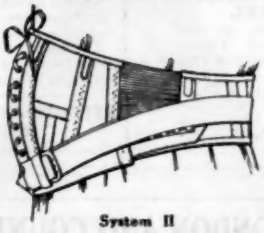

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A Discourse
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EHRLICH'S "CHEMOTHERAPY,"
AND ON CERTAIN GENERAL PRINCIPLES WHICH REQUIRE TO BE BROUGHT INTO APPLICATION IN ALL TREATMENT OF BACTERIAL DISEASE.

BY SIR ALMROTH E. WRIGHT, M.D., D.Sc. DUB., F.R.S.,
PROFESSOR OF EXPERIMENTAL PATHOLOGY IN THE UNIVERSITY OF LONDON; PRINCIPAL OF THE INSTITUTE OF PATHOLOGY AND RESEARCH, ST. MARY'S HOSPITAL.

EHRLICH, who was the originator of the therapeutic method which is to supply a principal theme of this discourse, elected to call this method of his devising—chemotherapy. That appellation must be judged unfortunate. For it runs counter to all principles of sound nomenclature to transfer to a species an appellation which properly belongs to a genus (and the name chemotherapy belongs, of course, by right, to every form of chemical treatment). A delinquency in nomenclature such as this can be retrieved only by adding to the appellation given a full complement of defining and interpreting clauses.

Here the following complement of glosses must be supplied:—

1. Chemotherapy, in Ehrlich's sense, signifies aggressive chemical action exerted on a biological element which is parasitic upon the organism. In other words, chemotherapy, in Ehrlich's sense, means for all ordinary purposes: *specific parasitocidal chemotherapy*.

2. Further, chemotherapy, as understood by Ehrlich, signifies chemical action, which, while attacking parasitic elements, leaves the organism fundamentally unaffected. (In other words, chemotherapy, in Ehrlich's sense, would, expressed in his terminology, be: *specific parasitocidal, predominantly monotropic chemotherapy*).

3. Lastly, the chemotherapy Ehrlich had in view was treatment by artificially manufactured chemical products, as distinguished from products elaborated in the animal organism in response to infection or vaccination. In conformity with this, Ehrlich's chemotherapy would be properly described as: *specific parasitocidal, predominantly monotropic pharmacotherapy*. Let me, in the sequel, use the term *pharmacotherapy* where Ehrlich would have spoken of *chemotherapy*.

We may now turn from the definition of the method to the conceptions which gave it birth. The fundamental principle of pharmacotherapy is that expressed in Ehrlich's dictum: that every substance which exerts any chemical action upon a body cell or tissue, or parasitic organism, does so by virtue of its anchoring itself—i.e., by laying chemical hold upon the element in question. That is the doctrine incorporated in Ehrlich's formula: *corpora non agunt nisi fixata*. The accessory ideas which afterwards grouped themselves round this foundational axiom were propounded by their author through the vehicle of technical terms. In choosing technical terms as the vehicle for his ideas, Ehrlich was, as reflection will show us, acting under happy inspiration. Let us, in this connexion, note that it has been pregnantly said of words in general—and this holds in a very special sense of technical terms—that they are in reality "agents of universal instruction." Further, words of all kinds, and "terms of art" more than all, furnish a *memoria technica*—one which keeps in mind things that would, if the words were not there to retain them, escape from the memory. The Latin apophthegm recounts it well: *Nomina si nescis, perit et cognitio rerum*.

In view of what has just been said, it will be seen that we may fittingly begin by studying the vocabulary in which Ehrlich has given expression to his conceptions on pharmacotherapy. In setting out that terminology it will be convenient to place in each case, the one over against the other, those terms that are antonyms, and to print in italics such words that are either lacking in precision or would be prone to carry into the mind erroneous implications.

EHRLICH'S APPARATUS OF TECHNICAL TERMS.

Receptor.	Haptophore (Hapten).
Mono-tropic.	Poly-tropic.
Organo-tropic.	*Parasito-tropic.*
(For example: neuro- hæmato- leucocyto- and erythrocyto- tropic.)	(For example: bacterio- staphylo- pneumo- or trypanosomato- tropic.)
Dosis Tolerata.	*Dosis Efficax.*
Therapia magna sterilisans.	*Therapia sterilisans fractionata.*
Cribrum therapeuticum.	

We may now, though this will involve rehearsing some very familiar material, proceed to pass in review this syllabus of technical terms. The expression *receptor*, as employed by Ehrlich, designates the atomic group in the body cell, tissue, or parasitic organism upon which the chemical agent in question anchors itself. The expression *haptophore* (which is the antonym to receptor) denotes the atomic group by which the chemical agent in question anchors itself to (the Greek says *grasps*) the receptor. The suffix *-tropic* applied to a chemical agent indicates that the substance in question combines with (the Greek says *turns toward*) the kind of cell, tissue, or parasite which is designated by the verbal stem to which the suffix is articulated. The classification into *parasito-* and *organo-* (or as we might better say instead of organo-, *histo-*) tropic is prone to mislead, inasmuch as it might erroneously suggest to the mind that the chemical affinities here in question are mutually exclusive, and that a chemical agent which is *parasito-tropic* cannot at one and the same time be *organo-tropic*. This particular blemish may, however, be deemed retrieved by Ehrlich having taken up into his vocabulary the expressions *mono-* and *poly-tropic* (these were coined by me in the mould supplied by Ehrlich), which definitely enunciate that an agent may combine either exclusively with one kind of cell, tissue, or parasitic organism, or, as the case may be, with a number of different kinds of cell, tissue, parasitic organisms, or any combination of these. But what we really require to know about a *polytropic* drug (and practically all drugs are *polytropic*) is whether it combines preferentially with, let us say, the parasitic element, and, *faute de mieux*, with the tissues and cells of the host; or, vice versa, preferentially with the cells and tissues of the body and only *faute de mieux* with the parasite. This might perhaps be conveniently expressed by saying that what we want to know of a drug is whether it is *proterotropic* for the parasite and *hysterotropic* for cells and tissues of the body, or whether it is *proterotropic* for the host and *hysterotropic* for the parasitic organism.

Following on now in our table we come to the expressions *dosis tolerata* and *dosis efficax*. Upon the accurate determination of these a very great deal depends. For the doctrine of Ehrlich tells us that the value of a therapeutic agent depends upon the *dosis tolerata* being definitely larger than the *dosis efficax*. And that doctrine is clearly empty of content if in this therapeutic fractional coefficient $\left(\frac{\textit{dosis tolerata}}{\textit{dosis efficax}}\right)$ the terms which serve as numerator and denominator, are ambiguous. And *de facto* that is the position of things. That the term a *dosis tolerata* is a term of ambiguous meaning will be obvious when we consider that a *dosis tolerata* might mean on the one hand a dose which is *tolerated by the organism taken as a whole*, and on the other hand a dose which is *tolerated by the leucocytes*. Ehrlich, when he used the term, had in view, of course, the dose *tolerated by the body as a whole*. Further, he had in view not the, presumably smaller, quantum that can be adminis-

tered to the diseased, but that, presumably larger, quantum which can be given to healthy men or animals without killing or manifestly poisoning them. But a clinically tolerated dose as thus defined is in point of fact in many cases a dose which weakens or abolishes the antibacterial defence of the body by poisoning the leucocytes. Such a quantum is obviously quite improperly designated a *dosis tolerata*. It would be much better called either a *dosis inermans* (i.e., a disarming dose) or a *dosis destituens* (a dose which leaves the body destitute of leucocytic defence).

The practical importance of the distinction between that (generally larger) quantum of a chemical agent which can be clinically tolerated and that (generally smaller) quantum which can be tolerated by the leucocytes is of obvious practical significance. It is common sense that a quantum of a chemical agent which paralyses the leucocytic defence must when administered to an animal organism which is suffering from a bacterial infection or which is (I am thinking here of prophylactic inoculation) to be exposed to risk of such infection, must work for mischief.

We turn now to the consideration of the term *dosis efficax*. A moment's consideration will show that this expression also is ambiguous. It may mean, to begin with, either a *dosis omnimo sterilisans* (such a dose as would sterilise the entire body), or (and this would be the ordinary meaning of the term) a *dosis sanguini-sterilisans* (a quantum that would sterilise the blood). And again the term *dosis efficax* might mean a *dosis uno ictu efficax*, or a *dosis sæpius repetenda*. Or, finally, it might mean the grand total dose of the drug which is, given in divided doses, required for the achievement of a satisfactory result.

This brings us to the consideration of Ehrlich's therapeutic projects. The first of these, the *therapia magna sterilisans*—i.e., the project of sterilising the whole body by a *dosis uno icto efficax*—that is sterilising it once and for all by a single dose of a drug—was definitely relinquished by Ehrlich in the salvarsan treatment of syphilis, when practical experience of this disease had brought it home to him that the largest dose of his arsenical remedies which could be exhibited without fatal consequences, failed to extirpate syphilitic infection.

Coming now to the *therapia sterilisans fractionata*, let us note with respect to the attribute *fractionata*, that this quite fallaciously suggests to the mind that the therapeutic procedure here in question proceeds upon the same lines as the procedure of fractional sterilisation employed in bacteriological laboratories in the preparation of culture media which do not support high temperatures. The fractional sterilisation which comes in that case into application depends upon the principle that microbic spores, which an application of moderate heat fails to kill, grow out when that heat is withdrawn into forms susceptible of being killed by such moderate temperatures as were initially ineffective.

Now, nothing of the sort can be supposed to supervene in the case of syphilitic spirochætes or other microbes living parasitically in the body. Not only are these micro-organisms not converted during treatment into more vulnerable forms, but, as Ehrlich's own work and that of Morgenroth showed, parasitic microbes tend to become more resistant to whatever drug is administered.

By the establishment of this general law, Ehrlich, in point of fact, withdraws from his *therapia sterilisans fractionata* all that scientific countenance which his nomenclature had illegitimately procured for it. And we shall presently have to inquire whether there is, in point of fact, any other scientific defence that can be adduced in defence of this seemingly unwarranted therapeutic procedure.

Finally, a few words may be said about the therapeutic procedure which employs two pharmaco-chemical agents and attacks the original microbic population with the first, and then such residue of that population as may survive with the second agent. This therapeutic device was called by Ehrlich a *cribrum therapeuticum*, for it was, as seen in his mind's eye, a device in which the physician places in position in the blood first a chemical barrier or grid so oriented as to intercept the bulk of the infecting microbes; and after that a second chemical grid oriented so as to hold back any micro-organisms which might succeed in getting past the first filter trap. As soon as we visualise this method of attack and meditate upon it, our mind sees that it can affect only microbes in the blood stream and the regions irrigated by this, and that it will leave quite unscathed those that have already penetrated into the remote backwaters.

With this we have completed our critical study of Ehrlich's terminology, and there will have been carried away from that critical analysis at least this, that the doctrine enunciated in those terms is inadequate and also in many respects erroneous. Out first task must accordingly be to try to win our way to a fuller and clearer comprehension of the problem which confronts the pharmacotherapist.

Reflection will show that we have here (and the same, of course, holds of immuno-therapy) not one but two separate problems. The one is a purely chemical problem; the other a problem in therapeutic engineering.

Let us consider, first, the one which is exclusively chemical. The task of composing a pharmaco-chemical bactericidal agent which shall be intracorporeally active is, as will be appreciated, infinitely more difficult than that of producing or finding an antiseptic of the ordinary kind. When a chemist is asked to provide the ordinary kind of antiseptic, all he is asked to do is to find a chemical agent which will destroy microbes, it being understood that the microbes shall be lying nude and exposed to chemical attack. When, on the other hand, a chemist is asked to produce a pharmaco-chemical bacterial agent which shall be intracorporeally active, there is required from him an agent which will kill this or that species not only when it is lying nude, but also when it is enveloped in albuminous fluids and secretory fluids of all kinds. And there is further required of him that he shall compose an agent which will kill microbes in the body without injuring physiological elements which are either directly essential to life or requisite for antimicrobic defence.

And the above does not constitute by any means a full account of what is required of a pharmaco-chemical agent. Not only must such an agent be poisonous for microbes, and so far as possible non-poisonous for the organism, but it must also be rapid in action so that it may complete its task before it is eliminated or rendered inactive.

The importance of this provision will be clear when we consider that it has been ascertained with respect to optochin,[1] operating upon the pneumococcus in blood in vitro in the maximum dose admissible in treatment, and again with respect to neosalvarsan,[2] operating upon the streptococcus under the same conditions, that these drugs do not poison the microbes until they have been in action for a period of many hours. And in this connexion there must be taken into account also the fact that in the body pharmacotherapeutic agents are subject to rapid wastage. We know, to begin with, that the kidney and liver are continuously at work removing foreign elements from the blood, and we know, further, with respect to bactericidal drugs, that unless they have been completely purged of their affinity for albuminous substances, they are, when employed in the body, subject to a further important wastage by the fact that they tie themselves up to the albuminous elements of the blood and tissues.

Having realised how difficult it is for the chemist to produce (and, of course, we cannot reasonably expect nature to provide ready-made) effective pharmaco-chemical bactericidal agents, we may now turn to consider the further problem which confronts the physician who has to bring such agents into application, not only (for that is a comparatively

[1] Moore and Chesney: Archives of Internal Medicine, 1917, xxi., 659.

[2] Colebrook, L.: Unpublished researches.

simple matter) upon microbes circulating in the blood, but also (and this is what is really difficult) upon microbes dispersed throughout the organism.

It is, in point of fact, a grave blot upon Ehrlich's wonderful work upon pharmacotherapy that he failed to realise why his projected *therapia magna sterilisans* in syphilis had come to nought. He, as we saw above, attributed this to his arsenical preparations having still, after all his efforts, retained considerable toxicity. Consideration of his now universally familiar therapeutic fractional coefficient $\left(\frac{dosis\ tolerata}{dosis\ efficax}\right)$ does not, however, elucidate the failure of the *therapia magna sterilisans*. For that formula quite fails to explain why a drug which is efficacious when applied to one part of an infecting microbic population, is ineffective with respect to another part of that same population.

Now, as will be shown, the real answer to this is that one part of the infective microbes are circulating in the blood or lie in regions to which there is ready access from the blood, while the other part lies in regions so physiologically remote that it might quite safely be postulated in connexion with treatment by arsenic, that even were 1000 times a lethal dose to be administered, no trace of that agent would ever penetrate there.

It will help us to realise that this is the true position of affairs if we consider for a moment the plan upon which the organism is constructed. The body is, in point of fact, constructed upon a plan of water-tight or almost water-tight compartments. Between the blood and the lymph is interposed the capillary endothelium which prevents all direct inter-penetration of fluids and permits only of interfusion by dialysis and restricted filtration. The lymph again is divided off from what we may call the *secretory fluids* by secretory membranes. How rigidly such membranes divide off the mother liquor (the lymph) from the secretory product is seen when we contrast the composition of the lymph with that of (*a*) the cerebro-spinal fluid; (*b*) the synovial fluid of the joints, bursæ, and tendons; (*c*) the aqueous and vitreous humour; (*d*) the mucus which coats the surfaces of the mucous membranes; and (*e*) the secretions proper, such as the tears, the saliva, the milk, the bile, and the urine.

It will be manifest from the above that the fluids of the body can, from the point of view of their accessibility to therapeutic operations, be ranged into three categories. There is, to begin with, the blood which can be directly influenced by the injection of chemical agents; then the lymph which can normally (wounds are here excluded from consideration) be reached only indirectly through the medium of the blood; and, finally, the secretory fluids which can be reached only remotely through the medium of the lymph.

Before addressing ourselves to the problem as to how chemical agents (I use the comprehensive term because the problem we are engaged upon concerns immuno-chemical as well as pharmaco-chemical agents) can be brought into operation not only in the blood, but all over the body, we must try to arrive at a clear conception as to what will happen when microbes obtain access, as the case may be, to the blood, the lymph, or the secretory fluids. And we shall do well to put to ourselves, in connexion with each category of fluid, the following three questions: *first:* Are microbes killed in this fluid by an onslaught of first intention? *Secondly:* How do such survivors as are left over after such onslaught make good their footing in the medium which has proved fatal to the majority? and *lastly:* How are such ensconced microbes subsequently combated?

We may begin by considering what happens when microbes obtain access to the blood stream. Here, except in the case where specially virulent microbes are in question, all, or at any rate a large proportion, are killed off by an onslaught of first intention, the sero-vulnerable microbes being destroyed by the torrent of bactericidal blood fluid which is brought to bear upon them, while the serophytic microbes (those which can draw nutriment from, and can accordingly grow out in the blood fluids) are, as soon as they get stranded in capillaries, phagocytosed and killed by the leucocytes. Further, when they are carried into the liver they are killed there after ingestion by endothelial cells.[3]

The microbes which survive this first onslaught make good their footing by rendering the blood apophylactic. They effect this (*a*) by absorbing agglutinating, opsonic, and bactericidal elements from the blood fluids, (*b*) by secreting toxins which either keep the leucocytes at bay or kill them.

Where there has been an incursion of large numbers of living microbes into the blood, and likewise where a massive dose of vaccine has been administered, the whole circulating blood may be brought down to a lower level of antibacterial, or, to speak in chemical terms, bacteriotropic potency—in other words, a general *negative phase* may be induced.

More frequently, however, the antibacterial potency of the blood will be reduced only in the immediate environment of the surviving microbes. These will, as a result of this, be lodged in non-bacteriotropic, or, as we may also call them, ecphylactic niduses. The formation of ecphylactic foci in infected tissues and organs will, as reflection will show, be dependent upon an arrest of the blood stream. So long as the circulation is maintained, the blood which has, by passing through the infected region, lost in anti-bacterial power will be continuously replaced by newly arriving antibacterially potent blood. When, however, the circulation is anywhere arrested, the blood will, by continued contact with the bacteria, become more and more poisoned and depleted in protective substances. And, *mutatis mutandis*, this will apply also when a portion of infected blood becomes converted into a clot, or when a quantum of non-coagulated blood is brought to a standstill by the blocking of a vessel by clot.

But intravascular clotting is very far from being the only event that will produce a local arrest of the circulation. Other physiological happenings can also bring about that result. We now know from Krogh's researches[4] that capillary loops are intermittently shut down by muscle cells upon their walls, and again opened up. And when we reflect on what must happen when capillaries through which infected blood is passing are shut down, we realise that the microbes which are in passage may be left high and dry upon the vessel walls or be imprisoned in isolated parcels of blood left behind in the lumen of the vessels. Opportunity may in this way be provided for the elaboration of ecphylactic foci. In relation to this I have proffered by way of suggestion that typhoid spots and other bacterial skin eruptions may quite well originate in this manner. It should be borne in mind in connexion with this suggestion that comparative measurements of (*a*) the agglutinins of serum derived from lymph admixed with blood obtained by pricking typhoid spots, and (*b*) of the agglutinins of blood obtained from the finger of the typhoid patients in question, have brought out the fact that the blood fluids obtained from the bacterial rash have only a tithe of the agglutinating power of the circulating blood.[5] And, presumably, exactly the same holds of the bactericidal power of these fluids. Further, in connexion with the development of bacterial rashes in typhoid fever and certain other septicæmias, this additional point may be considered. Microbes stranded in empty capillary loops in the dermis will probably, inasmuch as such microbes are less likely to be disturbed by a flushing out of the capillaries, find more favourable conditions for growth than would microbes stranded in capillary loops in muscles and glands. For, supposing microbes to be held back in the situations last mentioned by the closing down of capillaries, they would, when the

[3] Manwaring and Coe: Jour. of Immunology, 1916, i., 401. Opie: General Review, Jour. Amer. Med. Assoc., Nov. 14th, 1925.
[4] Harvey Lectures, Series XVIII., 1922–23.
[5] Wright and Lamb: THE LANCET, Dec. 23rd, 1899.

hyperæmia which goes with muscular and glandular activity supervenes, inevitably be swept out to meet their fate in the general circulation.

In addition to the machinery which closes down the capillaries there is in the organism other machinery which brings to a standstill blood previously in circulation. It has recently been shown by Barcroft [6] that the spleen regulates the volume of blood in circulation by loading itself up with additional blood when the volume of the circulating fluid is in excess of requirements; and by disbursing that blood when a larger volume of circulating fluid is required. It needs no gift of second sight to see that the withdrawal of blood into the stagnant diverticulum of the spleen will, in the case where that blood is infected, provide the microbes with opportunity for encasing themselves in ecphylactic envelopes. This no doubt accounts for the infecting microbe being regularly found in the spleen in typhoid fever, in Malta fever, in spirillum fever, and in anthrax; and for its being found there in large numbers (and in typhoid fever in the form of definite colonies) when the circulating blood is sterile. And again in this connexion it deserves to be remembered that in the three first-mentioned septicæmias with regard to which data are available[7] the blood from the spleen has been found in each case conspicuously inferior in antibacterial potency to the blood from the heart.

Turning now to the question as to how microbes which have ensconced themselves in ecphylactic niduses in the blood are subsequently combated, we may note that here both mechanical factors (in the form of alterations in the circulation), and chemical and biological factors (in the form of increased antibacterial potency of the leucocytes and blood fluids) may play their part. It will suffice in connexion with these last to note that the leucocytes which may under the stimulus of infection have acquired increased confrontation power and phagocytic efficiency; and the blood fluids, which may under that impulse have acquired increased bacteriotropic and antitryptic powers, may by degrees come into operation upon the microbes sheltering in ecphylactic niduses. With regard to the mechanical factors, the points of importance are these: Blood-vessels which have been closed down may be opened up, the circulating blood with its superior antibacterial potency being thus let in upon bacterial colonies which have grown out in ecphylactic niduses. Further, by contractions of the spleen blood which has been lying stagnant in its diverticula may be returned to the circulation, the contained bacteria being thus resubjected to attack by the circulating blood fluids and leucocytes.

It is in this connexion interesting to ponder the question as to why in the ordinary streptococcal septicæmia there is neither growth of streptococci in colonies in the spleen, nor a bacterial eruption such as would indicate an outgrowth of microbes in the capillaries of the skin. In connexion with that problem it may be thrown out by way of suggestion that the absence of streptococcal growth in the spleen and in the cutaneous capillaries may perhaps stand in relation to the rigors. For see-saw changes in the circulatory system are of the essence of a rigor. In the cold stage the capillaries of the skin would be closed down, room being found for the expelled blood by the opening up of the diverticula in the spleen. In the hot stage the capillaries of the skin would be widely thrown open and any microbes which had been stranded there would be carried off into the circulating blood. And concurrently the spleen would contract to furnish the additional volume of blood required, and with this any microbes which had found temporary lodgment in its diverticula would in their turn be swept out into the blood stream.

We can now pass from the events which follow the introduction of microbes into the circulating blood to those that ensue when microbes are implanted into the lymph-infiltrated tissues. With respect to these two points require to be borne in mind: first, that there is not normally to be found there any population of leucocytes such as could protect them against an incursion of microbes; and, secondly, that lymph which lies in the tissues would, if we may generalise from such data as are available, appear to be of less bacteriotropic, and in particular of less antitryptic, potency than the circulating blood fluids. Microbes entering the tissues will accordingly be subjected to no such immediate assault as microbes entering the blood. Nevertheless, if we look a little further and regard the fact that reinforcements of leucocytes and serous fluid can be very rapidly poured in from the blood we may (and in reality this is merely forsaking verbal accuracy for substantial truth) accredit the lymph lying in the tissues with a faculty of killing microbes by first intention.

But—and this is all important as explaining the conditions under which microbes establish themselves in the tissues—effective killing of microbes in the lymph spaces is achieved only when there is adequate transport of phylactic elements from the blood into the tissues, and further only when a proper balance is conserved between its two elements, leucocytic immigration and serous effusion.

(1) When leucocytic immigration into the focus of infection is inhibited by the agency of bacterial toxins and serous fluid containing few or no leucocytes is transported into the seat of infection, there is furnished to the invading microbes (let it be remembered that these are in practically every case serophytes) a ready-made ecphylactic nidus. To begin with, the transuded fluid provides the microbes with a favourable nutrient medium. Added to that phagocytic activity on the part of such leucocytes as are contained in the effusion is rendered impossible by the fact that leucocytes cannot dive into fluid and swim out in pursuit of microbes. And, finally, such leucocytes as have come out into the lymph cannot by reason of their paucity communicate to it any appreciable bactericidal power. This will be the position of affairs when we are dealing with œdematous swelling of the subcutaneous tissues or effusion into serous cavities.

(2) The formation of ecphylactic niduses in infected tissues will perhaps be favoured also in the case where emigration preponderates over transudation, and the emigrated leucocytes collect forming impacted foci of suppuration. In foci—such as we have in abscess sacs and in suppurating wound cavities—the leucocytes will under the influence of bacterial toxins, of deleterious external influences, or of both, first lose their power of phagocytosis and then succumb and disintegrate. When that happens the trypsin set free will reduce the antitryptic power of the surrounding fluid; and given that a considerable number of leucocytes disintegrate in a relatively small quantum of liquor puris, this will be converted into a definitely tryptic fluid. In the former case serophytic growth will be facilitated; and in the second not only serophytic but also non-serophytic microbes will be lying in a medium in which they can pullulate unrestrained.

Passing now from the study of the genesis of ecphylactic foci in the tissues to inquiry as to how the organism can combat microbes which are growing in such a nidus, there have here, as in the case of the blood considered above, to be regarded, first mechanical and secondly chemical and immunological factors. In the case where an immoderate serous effusion has converted the site of infection into an ecphylactic nidus, the position (we are assuming, of course, that there is no therapeutic interference) can be retrieved by a spontaneous resorption of the excess of fluid or a supplementary emigration of leucocytes. Similarly, where a breaking down of emigrated leucocytes and a corresponding blunting off of the antitryptic reaction of the transudation fluid has converted the seat of infection into an ecphylactic focus the situation would be retrieved by the supervention of further

[6] THE LANCET, 1926, i., 544.

[7] **Courmont**: Comptes Rendus Soc. de Biologie, 1897. **Wright and Lamb**: loc. cit.; **Lamo**: Scientific Memoirs by Medical Officers of the Army in India, Part XII., 1901.

serous effusion. For such superadded effusion would counteract leucocytic disintegration and at the same time limit serophytic, and arrest if such were in question serosaprophytic, microbic growth. Finally, it requires to be added by way of a rider that if the reinforcing leucocytes which immigrate into the focus of infection possess by virtue of an immunising response made by the organism increased confrontation power and increased phagocytic efficiency, and, similarly, if the reinforcing transudation fluid which is effused into the focus of infection has greater antibacterial potency, this improvement in the quality of the reinforcements will in each case conduce to a greater slaughter of microbes.

Having now considered how bacterial infections are combated in the blood, and in the lymph and tissues which are impregnated with lymph, our next task will be to inquire what provision exists for dealing with microbes which have found their way into a secretory fluid, or a tissue which is impregnated by or irrigated with a secretory fluid. In this inquiry a distinction must be made between three categories of secretory fluids. The first kind would be those which have the function of irrigating internal or external surfaces which lie open to infection from without. The secretory fluids which would be comprised in this class—in other words, tears, saliva, and mucus—possess the power of destroying all, other than specially acclimatised species of microbes. Let it be noted in passing that the bactericidal and bacteriolytic power here in question is a function of an antibacterial element (the so-called lysozyme)[8] which is distinguishable from the antibacterial elements of the blood fluids. The second class of secretory fluids comprises the synovia of the joints, tendon-sheaths, and bursæ, further the aqueous and vitreous humour, and, lastly, the cerebro-spinal fluid. The third and last class of secretory fluids would be the secretions proper, such as the milk, the bile, and the urine. The two last specified kinds of secretory fluids possess either insignificant antibacterial power, or, in the case of the cerebro-spinal fluid, so far as is known, none at all.

Coming now to what has application to the case where microbes have invaded a secretory fluid, or a tissue which is bathed in, or a surface which is irrigated by, or a cavity which is filled with such a fluid, reflection will show that here antibacterial elements from the blood might be conveyed into the site of infection by one or other of two channels. It is *in primis* conceivable that drugs—as distinguished from antibodies—might be extracted from the lymph by the secretory epithelium and be excreted into the site of infection.

We know that urotropin passes in this way from the blood into the cerebro-spinal fluid and the urine; that methylphenolphthalein passes thus into the bile; iodides into the saliva; and various drugs into the intestinal secretions. But these are altogether exceptional occurrences, and even a moment's reflection will show that the odds against a pharmaco-chemical bacteriotropic agent or an antibody passing through an intact secretory membrane into, let us say, the tears, or the vitreous humour, or the synovial fluid, or any secretory fluid other than milk are so great as to be almost incapable of expression in figures.

Coming now to the alternative channel by which antibacterial elements contained in the blood might be transported into the secretory fluids, it will be appreciated that blood-fluids containing drugs or antibodies would in inflammation which involved a destruction of secretory epithelium be transported by way of the lymph directly into the focus of infection. Furthermore, consideration will show that antibodies from the blood might also by the agency of negative pressure be drawn out into a secretory fluid. Reference is made later to the work of Speranski,[9] which shows in connexion with the treatment of tetanus and rabies that therapeutic substances in sera can by completely aspirating the cerebro-spinal fluid be drawn from the subdural spaces into the substance of the central nervous system. Turning to the leucocytes it is conceivable that these might, even through an intact (and a fortiori through a damaged) secretory membrane emigrate into a secretory fluid.

But with regard to all such direct transport of protective elements from the blood into secretory fluids the following requires to be specially emphasised. The blood fluids will always work at a great disadvantage when they are either diluted or frequently washed away by secretory fluids. And similarly leucocytes emerging into a secretory fluid will be eminently ineffective. Illustration of this is furnished by, for example, gonorrhœal infections of the conjunctiva, genital mucous membrane, and joints.

The foregoing will have made clear that the efficacy of antibacterial treatment by pharmaco-chemical bacteriotropic agents depends not only upon their entering into rapid destructive chemical combination with the microbes and exclusively with these, but also upon the chemical agents in question being transported from the blood into the lymph and from the lymph into the secretory fluids. It has further appeared that the failures of pharmaco-chemical—and the same holds good of immuno-chemical treatment—are, as it would seem, more often imputable to a default of convection than to a default in the chemical constitution of the therapeutic agent employed.

And the mental picture we have just arrived at will be seen to fit in well with clinical observation which teaches that antibacterial treatment is wont to be more effective early in an infection—that is, when the microbes still lie open to attack in the lymph and the circulating blood—than in the later phase when they have entrenched themselves in e phylactic foci. We have in the domain of pharmaco-therapy illustration of this in the fact that salvarsan when given early in syphilis does in many cases extinguish the infection while, when given later, it very often fails to effect this. Further striking illustration of the therapeutic principle here in question is furnished by the fact that bismuth [10] given to animals inoculated with the spirochætes of hæmorrhagic icterus will, if employed soon after the inoculation, extinguish the infection, while it fails to do this when given after the lapse of a few days. This is the exact reverse of what happens with sanocrysin. The experiments of my fellow-worker, R. M. Fry,[11] have shown that this agent, which was reputed to enter into destructive chemical combination with tubercle bacilli, does not, even when employed in concentrations much stronger than would be possible in the body, interfere with the growing out of tubercle bacilli into colonies in the blood in vitro. And further, the experiments of Madsen and Morch [12] have shown: *first*, that sanocrysin does not, when given with or immediately after an injection of tubercle bacilli in any way hinder the march of the infection; and, *secondly*, that the drug given at a later date, and employed in strictly adjusted doses, saves a certain number of animals. The former of these findings is in obvious accord with the results obtained by Fry. The latter is, no doubt, explained by the fact that sanocrysin induces, like tuberculin, an infractive inflammation of ecphylactic niduses—such infraction being followed in non-resistant men and animals by a disastrous tubercular septicæmia, but no doubt in men and animals whose blood has been fortified by auto-immunisation,[13] by a destruction of the tubercle bacilli carried into the circulation.

The general principles which should inform all antibacterial treatment having now been set forth, our next task must be to consider the method by which antibacterial elements which may be present

[8] A. Fleming: Proc. Roy. Soc. B., 1922.
[9] Speranski: Annales de l'Institut Pasteur, xli., February, 1927.

[10] Sazerac, Nakamura, and Kitcheritz: Comptes Rendus Acad. des Sciences, 1927, 184, 411.
[11] British Journal of Exp. Pathology, 1926, vii., 174.
[12] Madsen and Morch: Acta Tuberculosa Scandinavica, 1926, ii., 99.
[13] Wright: Paper on the Cultivation of the Tubercle Bacillus in the Blood, THE LANCET, 1924, i., 218.

in the circulating blood can be brought into operation upon infecting microbes in ecphylactic niduses.

We may conveniently begin our consideration of these methods by considering what we here require by way of terminology. We require, first, a general term which will embrace every kind of procedure which brings destructive agencies into operation upon microbes which would in the natural course of events escape unscathed. The term *kataphylaxis* will, perhaps, supply what is here wanted. We may further desire to distinguish *kataphylactic procedures* into: (*a*) *leucocytagogic procedures* which bring leucocytes, and (*b*) *seragogic procedures* which bring serum into operation. And, finally, where we have in mind the bringing of pharmaco-chemical elements into operation in regions which are sequestered from the blood stream, we may employ a term which is already in use, the term *kataphoresis*.

We may now take up the study of the methods of bringing pharmaco- or immuno-chemical substances into operation upon microbes which have elaborated ecphylactic niduses for themselves within the domain of the vascular system.

We have seen that opportunity for the establishment of ecphylactic niduses within the domain of the vascular system is provided, *first*, when the blood current is arrested by intravascular coagulation; *secondly*, when capillaries in the skin or elsewhere are closed down by the contraction of muscle cells in their walls; and *thirdly*, when blood which has been in circulation is brought to rest in the diverticula of the spleen. In the first case all that can be done is to administer citric acid [14] with a view to diminishing blood coagulability and preventing the reinforcement of the primary clot by a series of supplementary clottings.[15] When by timely intervention those reinforcements of the clot have been warded off, the lumen of the vessel will be rendered patent by the normal retraction of the fibrin and the washing out of the red corpuscles which constitute what we might call the "stuffing" of the clot. It will be obvious that when this packing of red corpuscles has been removed dissolved antibacterial elements both chemotherapeutic substances or antibodies, and also efficient leucocytes—supposing always that we have these in the circulating blood—will come into operation upon the microbes which have been sheltering within or behind the clot.

In the case where microbic colonies are lodged in the capillaries of the skin, these can be opened up by heat and other vasodilator influences. And such opening up will, in the case where antibacterial substances are circulating in the blood, result in these being let in upon the microbes, while the bulk of these will be swept out into the circulating blood and will, when that blood is bactericidally potent, be destroyed there. Let us call this *infractive and korethric* treatment (*korethric* from korethros—a besom or sweeping brush).

Ecphylactic niduses in the spleen require, like those in the capillaries, korethric treatment. But here instead of producing dilatation we require to produce contraction of the spleen. We might here avail ourselves of the fact brought out by Barcroft that vascular changes which call for an increased volume of circulating blood (changes such as general cutaneous vasodilatation and the dilatation which accompanies muscular action) produce a reflex contraction of the spleen. Or again, we might, making use of other physiological data furnished by Barcroft, produce a reflex contraction of the spleen by cutting down the respiratory value of the blood by administering carbonic oxide, or better (for this will be innocuous) ordinary carbonic acid gas. And, lastly, we might employ adrenalin, or again certain other pharmaco-chemical substances studied by Binet, Cardot, and Fournier [16] and so produce direct in lieu of reflex contraction of the spleen.

It is interesting to note in connexion with the exhibition of adrenalin that it has in cases of latent malaria been successfully employed for contracting the spleen and evacuating into the circulating blood (for purposes of diagnosis) crescents and other malarial parasites which have, as the common formula says, "retired from the superficial circulation into the spleen." It will be recognised that the parasites in question are not, in point of fact, organisms which have "retired" into the spleen, but organisms which (and the same happens to typhoid bacilli in typhoid fever, and spirilla in relapsing fever) have been able to establish favourable conditions for growth in the stagnant blood of the spleen, when those organisms which continued to circulate in the blood were killed.

A further point of interest in connexion with the administration of adrenalin in these cases is that very severe attacks of malaria are reported to have been produced by the treatment.

We have here again illustration of the fact that it is a sinister procedure to sweep microbes out from the foci in which they are lying quiet into the general circulation, unless we have ascertained before we do so that the blood in the general circulation has become bactericidally potent, or unless antibodies or pharmaco-therapeutic remedies have been introduced into the blood in order to prevent a generalisation of the infection. The risk of disseminating microbes into blood not capable of killing them was long ago abundantly illustrated in connexion with Koch's treatment of phthisis by tuberculin. It has also recently been illustrated in connexion with the administration of sanocrysin to tuberculous patients.

We pass now to consider the kataphylactic procedures which can be brought into application upon ecphylactic foci situated in lymph-infiltrated tissues and secretory fluids. Let us distinguish these into procedures which are both leucocytagogic and seragogic, and into those which are seragogic only.

Procedure.	*Physiological action.*
(1) Induction of active hyperæmia and inflammatory irritation.	Leucocytagogic and seragogic.
(2) Induction of passive congestion by Bier's bandages.	Seragogic only.
(3) Induction of œdema ex vacuo by depletion and evacuation of the local focus of infection.	Seragogic, and possibly leucocytagogic.
(4) Lowering of the general blood coagulability.	Seragogic only.
(5) Induction of Arthusian inflammation.	Leucocytagogic and seragogic.
(6) Employment of albumino-tractor (intertracting) agents.	Seragogic only.

The principles of the first three of these procedures and the methods of exploiting them being, it may be assumed, universally familiar, it will be unnecessary to say anything about them here, except only again to refer to the brilliant work of Speranski,[17] which shows in connexion with the treatment of rabies and tetanus (and the same would probably apply to all other cerebral infections) that antimicrobic and antitoxic elements contained in sera introduced into the subdural space can by the agency of negative pressure (established by the complete evacuation of the cerebro-spinal fluid under anæsthesia) be drawn into the substance of the central nervous system.

With regard to the principles of the three last kataphylactic procedures these may with advantage be briefly elucidated.

Lowering of the General Blood Coagulability.—I showed in a series of papers now many years ago that urticaria, chilblains, physiological albuminuria, and anasarca could all be brought under the general heading of serous hæmorrhage, and that such serous hæmorrhage, or to give it its more usual name, excessive serous effusion, is correlated with diminished blood coagulability and is aggravated by the exhibition of citric acid and other agents which reduce blood coagulability, and alleviated by calcium chloride

[14] Wright: B.M.J., July 14th, 1894. Wright and Knapp: Causation and Treatment of Thrombosis Occurring in Connexion with Typhoid Fever, THE LANCET, 1902, ii., 1531.
[15] Wright and Colebrook: Technique of the Teat and Capillary Tube, Chart VII., Appendix 1, pp. 133, et seq.

[16] Comptes Rendus Soc. de Biologie, 1927.
[17] Loc cit.

and other agents which increase blood coagulability.[18] Consideration will show that the principle here involved has application also to the treatment of bacterial infection in the tissues and more specially to pharmacotherapeutic treatment. For manifestly there will be better prospect of bringing a drug into operation in the tissues if the blood at the time the drug is introduced is in a state to furnish a maximum of serous exudate.

It will be interesting in this connexion to hark back to the paradox encountered earlier in this paper, the paradox that syphilitic infection is not infrequently

Photographs of Vertical and Horizontal Intertraction.

FIG. 1. FIG. 2.

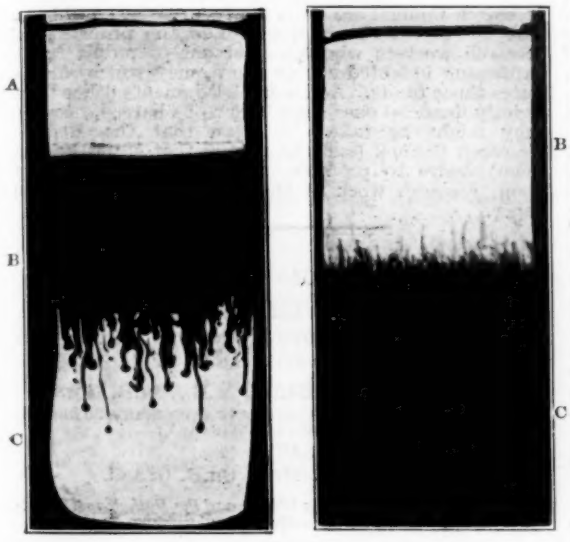


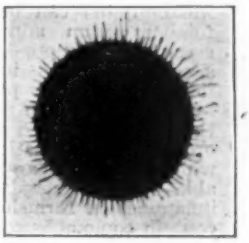
FIG. 1.—Here a layer of serum coloured with eosin (B) has been superimposed upon a layer of a specifically heavier (10 per cent.) salt solution (C). Beginning almost instantaneously the serum is rapidly drawn down (*descending intertraction*) into the salt solution in the form of pseudopodial streamers. Above the layer of coloured serum (B) the vessel is filled with water (A). Into this after long waiting the serum gradually diffuses spreading upwards not in streamers but in the form of a level horizontally dispersed wavefront.

FIG. 2.—Here uncoloured serum (B) is superposed upon a layer of coloured 10 per cent. salt solution. (C) After the lapse of a few minutes the salt solution is drawn up into the serum (ascending intertraction) again in the form of polypoid streamers.

successfully extinguished by following out that theoretically unsound procedure which Ehrlich called a therapia sterilisans fractionata. Let us see whether this problem can now be cleared up. Partial illumination may perhaps come to us when we reflect that a drug taken in repeated doses will, according as different tissues and different portions of the body happen, after the incorporation of the dose to be thrown into activity, be determined each time to a different anatomical region. And on the doctrine of chance there will in the case where many doses are administered be a prospect of the drug being carried in turn into all such foci of infection as are accessible. From this clinical advantage is naturally to be expected. But there is superadded to this factor of chance another physiological factor which is operating steadily, in the direction of making the sequent doses of salvarsan more and more effective. Salvarsan, given in repeated doses, regularly and markedly lowers the coagulability of the blood. One can immediately see that this is bound to promote a freer flow of arsenic-carrying lymph through the tissues.

Now, if it is this—and it may well be this—that renders the theoretically unsound therapia sterilisans fractionata practically effective, it would be well to consider whether it would not be more rational to begin the treatment of syphilis by administering citric acid in quantity sufficient to diminish blood coagulability and increase with this serous effusion all over the body. One might then hope to accomplish as much by a first dose of salvarsan as is by the ordinary procedure accomplished after a long series of doses.

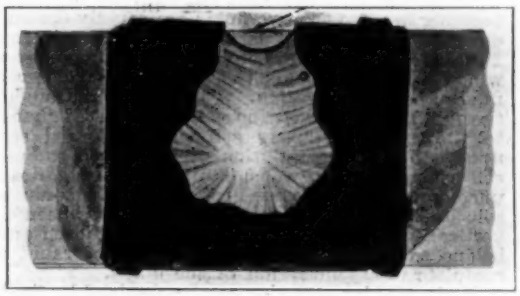
FIG. 3.



Here a disc of filter paper which has been fastened by a pellet of plasticine to the surface of a paraffin-rimmed cover-glass and has been impregnated with coloured serum has, after firm blotting, been floated inverted upon a 4 per cent. salt solution. Into this the serum is drawn out from the filter paper in the form of an ever-lengthening system of streamers.

Induction of Arthusian Inflammation.—It was shown by Arthus [19]—and our understanding of the subject has been much extended by Opie [20]—that when repeated doses of a foreign serum are hypodermically or intradermally inoculated, the third or fourth of the series (the first two having no visible effect) will be

FIG. 4.



Here a piece of specially dense filter paper has been cut out in such a way as to represent an axial section of a wound cavity. The artificial wound section thus obtained is then impregnated with coloured serum. It is then interpolated between a couple of microscopic slides and these are clamped together. This done any serum which may have escaped into the cavity is carefully evacuated, and the cavity is then filled with an ordinary 5 per cent. salt solution, or better with serum containing 5 per cent. of salt. As soon as this has been done the coloured serum is drawn out in streams from the encasing walls into the saline solution occupying the cavity of the artificial wound.

followed by some local œdema, the fifth and sixth by a more pronounced œdema, and the later injections not only by serous effusion but also by emigration of leucocytes and often by localised necrosis. It has been shown that the development of these phenomena is correlated with an elaboration of precipitins in the blood of the injected animal, and that the inflammatory reaction which follows incorporation

[18] Wright: Remarks on Methods of Increasing and Diminishing the Coagulability of the Blood, with special reference to their therapeutic employment, Brit. Med. Jour., July 14th, 1894. *Idem:* On the Treatment of the Hæmorrhages and Urticarias which are Associated with Deficient Blood Coagulability, THE LANCET, Jan. 18th, 1896. *Idem:* On Two Cases of Urticaria Treated by the Administration of Calcium Chloride, Brit. Jour. of Dermatology, vol. viii., 1896. *Idem:* On the Association of Serous Hæmorrhages with Conditions of Defective Blood Coagulability, THE LANCET, Sept. 19th, 1896. *Idem:* On the Pathology and Treatment of Chilblains, THE LANCET, Jan. 30th, 1897. *Idem with Ross:* On the Pathology and Treatment of Physiological Albuminuria, THE LANCET, Oct. 21st, 1905.

[19] Comptes Rendus Soc. de Biol., 1903, p. 817. Ibid., 1478.

[20] Tubercle, October, 1925. Journal of Immunology, vol. ix. No. 4, 1924. Journal of Exp. Med., 1924.

of the foreign serum is probably due to its precipitation at the site of injection. An Arthusian reaction, quite similar to that obtained in the manner just described, can be produced by injecting into the blood of the animal which is to receive local inoculation of a foreign serum an antiserum to this. And again—and this is a procedure which might perhaps be employed in treating a localised infection—an Arthusian inflammation can be produced also by injecting a foreign serum admixed with precipitating antiserum. Let us note—for the fact may have therapeutic significance—that in all varieties of Arthusian inflammation the products of inflammation differ in a respect which may render them more effective than those furnished in ordinary inflammation. While ordinary inflammation furnishes a serous effusion which contains sparse leucocytes and is itself favourable to the growth of serophytes, an Arthusian inflammation furnishes a serous effusion which may contain copious leucocytes and is (it has presumably become so probably by virtue of a liberation of bactericidins from leucocytes) definitely bactericidal. Consideration will show that this method may in the future be found to have therapeutic applications. A mixture of serum and antiserum, or possibly an antihuman precipitating serum by itself, is the sort of agent which could be injected not only into an infected tissue or a neoplasm, but also into an infected serous effusion or secretory fluid. I have specially in view infections of the central nervous system and not alone syphilitic infections, but others like encephalitis lethargica, infantile paralysis, and rabies.

Employment of Albumino-tractor (Intertracting) Agents. It was long ago shown by Heidenhain that strong solutions of sodium chloride and other salts and also of sugar functioned when introduced into the blood as powerful lymphogogues. In connexion with these same solutions, I have, from 1900 onwards, and in particular during the war, been pointing out that they, when introduced into wounds or sinuses, operate as powerful local lymphagogues causing a welling up of serum, and with this a cleansing of these niduses of infection from all but serophytic microbes. Further, I have recently shown [21] that when serum and hypertonic salt solutions are brought together in vitro the two fluids are rapidly drawn the one into the other in a pattern of polypoid streamers. I have called the force which here operates and which draws the fluids the one into the other and mixes them *intertraction*. The mutual indraught of the fluids here in question can be rendered manifest to the eye by floating artificially coloured serum upon a 5 per cent. solution of sodium chloride in a cell which has plane walls, or alternatively by floating uncoloured serum upon coloured hypertonic salt solution in such a cell. As soon as this has been done vertical intertraction, as represented in Figs. 1 and 2, begins to manifest itself in the form of rapid and complete interpenetration of the fluids.

Horizontal intertraction can be obtained by floating upon a 4 per cent. salt solution a disc of filter paper fixed upon the lower surface of a paraffined rimmed cover-glass, and then impregnated with coloured serum. This gives appearances such as are depicted in Fig. 3.

A further experiment which illustrates the intertraction which is produced by the introduction of hypertonic salt solution into wounds is illustrated in Fig. 4. Here a dense filter paper which has been cut to represent the profile of a wound in section has been soaked in coloured serum and has been interposed between two slides. These arrangements made, the slides are clamped together, any superfluous serum in the cavity of what we may call the artificial wound is removed, and then there is filled into that cavity either hypertonic salt solution or better serum which contains 5 per cent. of salt. This done, the coloured serum which impregnates the paper is seen to flow out in the form of streamers in the wound cavity.

[21] Wright: Proceedings of the Royal Society B., vol. xcii., 1921; A, vol. cxii., 1926; A, vol. cxiv., 1927.

Consideration will show that hypertonic salt solutions can find useful kataphylactic application not only as local seragogues directly introduced into the wound for cleansing it from non-serophytic infection, but also when they are injected into the blood. They will then, as Heidenhain's classical experiments showed, function as powerful general seragogues. And thus employed they will, in the case where the circulating blood contains chemotherapeutic elements (immuno- as well as pharmacotherapeutic elements) be bound to carry these in a rapid stream through the tissues, achieving very rapidly that transport of antibacterial elements into the foci of infection which will, even when it is favoured by reduced blood coagulability, be accomplished only very slowly.

In concluding, I may, perhaps, venture to explain that acknowledgments of indebtedness to the Medical Research Council are here, for two reasons, withheld. The one is that I am doubtful of the propriety of research workers who are paid out of public funds expressing indebtedness to the agency which distributes those funds. And acknowledgments other than strictly financial ones seem here to be barred, because they might be taken to mean that the Medical Research Council (and the powers that stand behind them) desire to promote, or even look favourably upon, research work of the type embodied in this paper.

A CASE OF
CANCER OF THE PANCREAS,
WITH METASTASES IN BONE-MARROW AND LIVER, AND MEGALOBLASTIC ANÆMIA.

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IT is now recognised that metastases in bone-marrow, secondary to cancer of certain abdominal viscera, may produce a blood picture resembling more or less closely that of pernicious anæmia. Such cases are not common and, when they do occur, it seems to us that they should be carefully investigated, in the hope that they may shed some light on the origin of the megaloblast and incidentally on the pathogenesis of pernicious anæmia itself. We wish, therefore, to place on record the following case.

A male patient, aged 50, a labourer, was admitted to hospital on Sept. 13th, 1925, complaining of general weakness and pain in the chest. Six weeks before admission he noticed that he was losing strength, and within a fortnight he was obliged to give up his employment. Further, in the four weeks previous to admission he lost 4 st. in weight, his appetite was poor, and he had attacks of sickness and vomiting. On one or two occasions his doctor had discovered albumin and sugar in his urine. There was no history of sore tongue, hæmorrhage, thirst, or polyuria, and there was no indication of disease of the central nervous system.

On admission he was emaciated and looked ill. The mucous membranes were pale, the skin had a slight yellowish tint, and he complained of vague pains in the right side of the chest. The heart sounds were of poor quality, but no murmurs were audible, and the blood pressure was low. There was slight lack of resonance with prolongation of expiration and increase in vocal fremitus at the apex of the right lung, while some scanty fine crackles were heard at both apices. The teeth were carious and the gums swollen and pale, but the tongue was clean. There was no abdominal pain, and the liver and spleen did not seem to be enlarged. The urine did not contain any abnormal constituent.

During his stay in hospital there was no sickness or vomiting, but the patient suffered from loss of appetite and great progressive weakness. Tenderness and a degree of resistance developed in the epigastrium and the liver increased very rapidly in size, the lower border ultimately reaching

below the umbilicus in the middle line. The spleen was never palpable, but, on percussion, as time went on, the splenic area seemed to extend forward to the costal margin. Fractional test-meals on two occasions showed the presence of free hydrochloric acid in normal amount. X ray examination suggested some deformity at the pylorus, associated with delay in the emptying of the stomach.

Coincident with the enlargement of the liver a slight bulging became noticeable in the right infra-axillary area. Definite pain was complained of over the ribs in this region with marked tenderness over the sternum and ribs. Towards the end the patient became greatly emaciated, he sank rapidly, his skin assumed a deeper yellow tinge, and the pain in the ribs and sternum increased. He died on Nov. 28th, 1925, 11 weeks after admission. There was never any pain in the long bones.

Throughout his stay in hospital the patient had a fairly profound degree of anæmia. Table I. shows the red blood-cell counts.

TABLE I.

Date.	Red blood corpuscles.	White blood corpuscles.	Hæmoglobin per cent.	Colour-index.
Sept. 14th ..	2,410,000	—	42	0·89
,, 23rd ..	2,720,000	5,000	35	0·64
,, 30th ..	2,730,000	8,150	35	0·64
Oct. 8th ..	1,920,000	5,650	28	0·73
,, 18th ..	2,360,000	7,870	32	0·66
Nov. 2nd ..	2,360,000	4,370	33	0·6

Blood counts by Thoma-Zeiss method. Hæmoglobin estimations by Gower's method.

Blood films, stained with Leishman's and Jenner's stains, showed a large proportion of megalocytes, some poikilocytes, polychromasia, and granular basophilia, and the constant presence of nucleated red cells. Neutrophil marrow cells were also observed in the blood films.

Table II. shows the results of four differential white cell counts, and the number of nucleated red cells per 300 white cells.

TABLE II.

Differential Counts of 300 White Cells.

Type of cell.	Sept. 13, 1925.	Oct. 21.	Nov. 11.	Nov. 27.
	Per cent.	Per cent.	Per cent.	Per cent.
Neutrophil polymorphs ..	54·6	47·4	57·3	74·6
Eosinophils	3	5·6	3·6	6·6
Basophils	0·6	—	0·4	0·4
Large mononuclears and transitionals	17·4	4	15·9	3
Lymphocytes	23	34·6	12·4	8·4
Myelocytes	1·4	8	7·4	5·4
Myeloblasts	—	0·4	3	1·6
Number of Nucleated Red Cells per 300 White Cells.				
Normoblast	2	5	8	12
Megaloblast	1	10	7	8

The blood-sugar on admission was 0·15 per cent. The Wassermann reaction of the blood was negative. H. van den Bergh's indirect quantitative reaction showed the bilirubin in the blood to be less than 0·25 units. Fouchet's test for bilirubin in the blood was negative.

Report of Post-mortem Examination.

Thorax: On opening the thorax a glandular mass was found in the mediastinum surrounding the trachea and bronchi and the great vessels arising from the aortic arch. Subsequent examination proved that it was a secondary involvement of the mediastinal glands by carcinoma. The apex of the left lung was also involved by a spread along the peribronchial lymphatics from the mediastinal mass, and throughout the substance of both lungs there were numerous small nodules of secondary carcinoma. There were a few very small nodules present on the parietal pleura along the line of the angles of the ribs on the left side. The heart presented no abnormalities. Abdomen: The liver was enormously enlarged, weighing 162 oz., the parenchyma being largely replaced by carcinomatous nodules of varying age and size. The larger nodules were of long standing judging from the umbilication present, but the majority seemed to be of recent date, since they varied in size from 4 mm. downwards. The hæmosiderin reaction was definitely positive and comparable to the reaction found in diseases associated with rapid blood destruction.

Hæmosiderin granules were found, on microscopic examination, to be present both in the liver cells and also in the endothelial cells. They were fine in character and scattered more or less uniformly throughout the liver cells. The reaction was not so intense as that found in many cases of pernicious anæmia where the hæmosiderin is present in large amounts. Extensive permeation of the liver substance had taken place with minute collections of malignant cells. The spread was up the biliary lymphatics, and no embolic cells were found in any of the blood-vessels. No evidence could be found of hæmatopoiesis in the liver, either megaloblastic or normoblastic, in the section examined. Spleen: The spleen was considerably larger than normal. Throughout the organ there was a diffuse invasion by malignant cells, varying from groups of 3 or 4 up to masses the size of Malpighian bodies. Embolic masses were to be seen in the arteries and veins spreading throughout the splenic sinuses. Nucleated red cells resembling normoblasts and eosinophilic leucocytes were seen in abundance. Endothelial cells containing ingested red blood corpuscles and altered hæmoglobin were present in considerable numbers throughout the sections.

Pancreas: The pancreas was found to be firm and fibrous. Situated in the substance at the junction of the body and head was a hard tumour about the size of a walnut, which was taken to be the primary tumour. Microscopic examination showed it to be an adenocarcinoma. The islets of Langerhans were prominent and congested, and seemed to be more abundant than normal. Kidneys: There was a chronic interstitial nephritis present in both organs. The bone-marrow from the long bones was examined and in all there was decided vascular reaction. The entire length of the shaft of the bone was filled with marrow of a maroon colour, and the appearance simulated that found in pernicious anæmia. Peculiar opaque gelatinous-looking areas were scattered throughout the marrow of all the bones which microscopic examination showed to be secondary deposits of adenocarcinoma. The bony trabeculæ normally present in the interior of the shafts of the bone were completely absorbed, and there was erosion of the inner wall of the compact bone, thereby increasing the available space for blood-cell production.

To such an extent was the left humerus weakened that during manipulation at the post-mortem it fractured. On microscopic examination the bone-marrow was in no case found to be normal, showing an erythroblastic reaction, with varying amount of replacement with adenocarcinoma. Films were made from the marrow of all the long bones and two of the ribs. Pieces of marrow were also taken, fixed in formalin, embedded in paraffin, and stained by Pappenheim's panoptic method, Leishman, eosin methylene-blue (Mallory), hæmalum and eosin.

Examination revealed (1) normoblasts; (2) megaloblasts, these being nucleated red cells of a large size with finely reticulate nuclei and a cytoplasm of an oxyphilic or polychromasic reaction, many of which were in a state of mitosis; (3) megalocytes showing both oxyphilic and polychromasic cytoplasm; (4) myeloblasts; (5) myelocytes, showing both oxyphilic and basophilic granules; (6) large numbers of adenocarcinomatous cells of spheroidal type. These malignant cells were situated in clusters, always in close relationship with one of the larger arterioles, but in no case were they found actually inside a blood-vessel. In some situations, however, they were enclosed by a fibrous tissue stroma lined with a delicate endothelium. This had been formed in all probability by the distension of the marrow sinuses with malignant cells. In other situations there was a diffuse infiltration of the marrow with malignant cells, and it is interesting to note that there was no special reaction on the part of the marrow in the immediate neighbourhood of the clusters of invading cells in the form of a megaloblastic reaction—i.e., in no place could the type of marrow cell immediately surrounding the clusters be considered to be different from that found throughout the marrow in general.

Discussion.

When the patient came under observation the diagnosis was not quite obvious. The progressive weakness, anorexia, sickness and vomiting, together with the anæmia and the blood picture, and the absence of any definite localising sign of neoplasm or other cause of anæmia, were suggestive of pernicious anæmia. However, the rapid enlargement of the liver, the presence of large numbers of nucleated red cells and myelocytes in the circulation, associated with pain over the ribs and sternum, suggested the diagnosis of malignant disease with bone metastasis. The presence of free hydrochloric acid in the stomach, and the result of the van den Bergh reaction, tended to confirm this diagnosis.

A striking feature of the case was the presence of large numbers of nucleated red blood corpuscles in the circulation and, in view of the conclusions of

Piney regarding the specific character of the megaloblast, special attention was directed to these cells. Piney holds that the true megaloblast has a finely reticulated nucleus, and that this specific cell is found only in pernicious anæmia and familial icterus. He maintains that it is formed in the liver as a fœtal remnant. The remaining nucleated red cells found in the circulation in various diseases he differentiates into two types: (1) macronormoblasts, which have cart-wheel nuclei and polychromasia of the cytoplasm, and (2) normoblasts. One hundred nucleated red cells were examined from 14 dry-blood films, eight films being stained with Leishman's stain and six with Jenner's stain. The measurements were made with eyepiece and stage micrometers. Forty-seven of the cells had average diameters of 10 microns or over. The smallest nucleated red cell had an average diameter of 7·2 microns, while the largest, two of which were observed, had average diameters of 12·75 microns.

In a general way, the size of the nuclei varied directly with the size of the containing cell. The largest, measuring 8·5 microns, were found in cells of 11 and 11·9 microns in diameter, while the smallest nucleus, 3·5 microns in size, was found in a cell of 10·2 microns in diameter. The largest cell, 12·75 microns, had a nucleus of 6·8 microns, and the smallest cell, 7·2 microns, a nucleus of 5·9 microns.

Great variation in structure was observed in the nuclei examined. The majority showed some degree of condensation of the basichromatin. In 15 there was definite pyknosis such as is seen in the normoblast, in 9 the basichromatin was arranged so that the structure of the nuclei resembled the "cart-wheel" type, while in 52 nuclei the condensation varied in degree from a mottled or blotchy arrangement to a stippled or granular appearance, and the formation of a rather coarse openwork reticulum. In two nuclei the basichromatin had the arrangement of a tangled skein, in six cells the nucleus was finely reticulate in character, and in another cell the nucleus was in chromosome formation. Fifteen nuclei showed fragmentation or segmentation. The six cells showing the finely reticulate appearance varied from 8·5 to 11 microns in average diameter. The cytoplasm of five of these cells was polychromasic, while in the sixth cell the cytoplasm stained faintly with eosin. Generally it was noted that the nuclei showing definite pyknosis, or some degree of pyknosis, were most often found in cells having eosinophil cytoplasm, yet such nuclei were also seen in cells showing polychromasia.

It is difficult to classify these nucleated red cells into clear-cut types, as the great variations in the size of cell, nuclear structure, and associated staining reaction of the cytoplasm seemed to represent different stages in the life of the nucleated red cell. The six cells already mentioned showing finely reticulate nuclei were thought to resemble those megaloblasts described by Piney as being specific to pernicious anæmia. Accordingly, these six cells, together with the other large cells having a large mottled, reticulate, or openwork nucleus, are regarded as true megaloblasts and similar in all respects to those found in the circulation in pernicious anæmia.

As regards the origin of the megaloblast microscopic examination failed to reveal the presence of blood-forming tissue in the liver. Megaloblasts were very numerous in the bone-marrow, and many were observed in the process of division. The megaloblast is not normally present in the marrow, but in this instance it is considered that the bone-marrow was the site of origin of this cell as well as the other nucleated red cells found in the circulation.

The possible relationship of this megaloblastic marrow to the tumour metastases is a question of some interest. Ehrlich has suggested that a toxin derived from the cancer cells might supply the stimulus which determines this change in the marrow. In this connexion the work of Russell is of interest. He showed that in mice the transplantation of carcinomatous cells could produce a sarcomatous change in the connective tissues of the new host. He quotes a case, reported by Schmorl, as illustrating the occurrence of a similar process in the human subject, where, in a man who died from carcinoma of the prostate, secondary deposits were found in the skeletal system. In the bend of the right femur one of the deposits was surrounded by an extremely cellular mesoblastic tissue of a sarcomatous type, this malignant change being induced by the carcinomatous cells. Russell also mentions the conclusion of Axhausen who attributed this change to irritation, presumably of a chemical nature, of the stroma by the cancer cells.

The human marrow is a mesoblastic tissue, and in our case just recorded it has taken on an embryonic type of growth, shall we say, in response to the invasion of cancer cells. Microscopic examination, however, failed to show that the megaloblastic reaction was confined to the vicinity of the tumour metastases, and so if the cancer cells were producing a stimulus, they would seem to have done so at a distance—i.e., the tumour toxins must act in a diffuse manner.

The character of the blood, marrow, and the hæmosiderin deposit in the liver in our case presents an appearance very similar to that met with in cases of pernicious anæmia where presumably there is also a toxin or some other form of stimulus acting on the bone-marrow and so inducing the megaloblastic reaction. If this is the case, it would suggest the conclusion that the marrow change in the presence of cancer metastases and in pernicious anæmia is the primary episode and that the hæmolysis and hæmosiderosis are secondary events. This is Ehrlich's original idea and it has the support of many other hæmatologists.

We acknowledge gratefully the invaluable assistance and helpful criticisms of Prof. W. K. Hunter and Prof. John H. Teacher in whose departments this work was carried out.

References.—A. Piney: Jour. Path. and Bact., July, 1924; Genesis of Pernicious Anæmia, 1925. B. R. G. Russell: Jour. Path. and Bact., Jan., 1910. W. K. Hunter: Recent Advances in Hæmatology, 1911.

THE EFFECT OF VARIOUS CARBOHYDRATE FOODSTUFFS ON THE BLOOD-SUGAR IN DIABETES.*

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IT has been known for a long time that the blood-sugar rises after a meal containing carbohydrate. It is probable that the less the pancreas is overstimulated by a raised blood-sugar, the better is the chance of a certain amount of recovery, or, at any rate, of stopping the progress of the disease. To prevent an excessive rise in the case of diabetic subjects, the carbohydrate in meals is restricted, but at present the custom is to regard all foodstuffs which contain the same amount of carbohydrate as equivalent in their effect. Such a view can only be definitely proved if the same variations of blood-sugar are found in a patient after meals containing various carbohydrate foodstuffs, the total amount of carbohydrate being kept constant.

Owing to the laboriousness of the work, it has not been found possible to examine very many of the carbohydrate foodstuffs suitable for diabetic patients, though some of the most important have been tested.

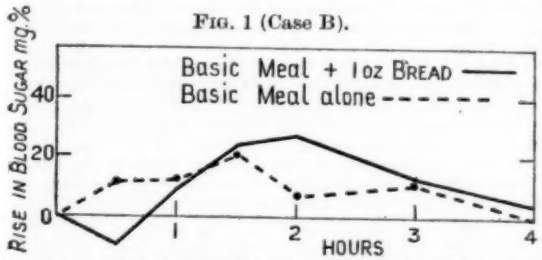
Method.—The method adopted was to give a diabetic subject a series of test breakfasts. One of the breakfasts consisted of two eggs, 1 oz. of butter, and tea, while the carbohydrate foods to be examined were added to the other breakfasts. The blood-sugar was estimated before and at quarter

* Most of this work was done while the author was holding the Parsons Fellowship at Guy's Hospital.

or half hourly intervals for three to four hours afterwards. As a series of daily tests were required, the choice of a subject was of some importance. A mild case was necessary in order to avoid giving insulin before the meal; the whole of the insulin required was given at night and in quantity sufficient to keep the fasting morning blood-sugar within reasonable limits (preferably about 0·1–0·12).

Cooking.—The rusks used were made by baking 1 oz. of bread in an oven till light brown in colour.

FIG. 1 (Case B).



Shows rise in blood-sugar after non-carbohydrate meal and also an almost similar rise preceded by a fall when the same meal plus 1 oz. bread was given. The base-line represents the initial fasting blood-sugar.

The carbohydrate content was estimated in another piece baked at the same time. The oatmeal was boiled for four hours, the turnips were boiled and mashed, the excess fluid being strained off. The carrots and potatoes were boiled 50 min. and the water strained off. The tomatoes were fried or baked in a tin. The cabbage was steamed for one hour.

In two subjects the response of the blood-sugar to the meals was irregular. In these the following two points were noticed: (1) A rise in the blood-sugar was obtained when the test breakfast without carbohydrate was given. (2) When a meal containing carbohydrate was given the first blood-sugar taken half an hour after a meal, instead of showing the usual definite rise, was either the same as, or actually lower, than the initial fasting blood-sugar (Fig. 1). Cammidge has obtained similar results and has correlated them with variations in the acid-base balance due to secretion of first acid and the alkaline digestive juices. It should be noted that in only two out of the seven cases examined here was such a result obtained, while presumably all secreted acid and alkaline digestive juices. In the case of these patients it was, however, considered that some factor other than the amount of carbohydrate taken was involved, and the results were not used in this investigation.

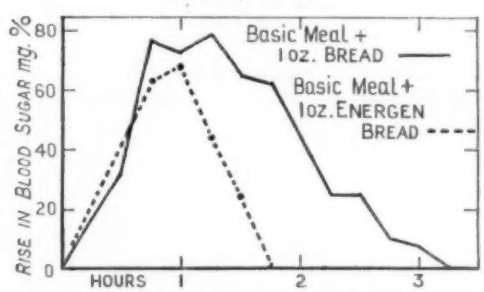
TABLE I.

Food.	Method of cooking.	Carbohydrate content. Anticipated percentage average in food tables.	Percentage of weight raw.	Percentage of weight after cooking.
Carrots, old	Raw.	7·7	5·44	—
	Sliced and boiled 50 min.	—	3·4	5·4
Carrots, young	Raw.	7·7	7·3	—
	Boiled whole 50 min.	—	4·9	5·5
Potatoes:—				
Duke of York large	Raw.	18·0	15·1	—
	Cut in half and boiled 50 min.	—	12·0	12·5
Duke of York small	Raw.	18·0	15·6	—
	Boiled whole 50 min.	—	15·1	18·0
Sharp's Exp. small	Raw.	18·0	—	—
	Boiled whole 50 min.	—	16·7	20·2
K.X., medium	Raw.	18·0	20·4	—
	Cut in half and boiled 50 min.	—	17·3	18·5
Lang's medium	Raw.	18·0	17·5	—
	Cut in half and boiled 50 min.	—	12·4	13·3

With the first two subjects the amount of carbohydrate food given was such as would contain 15 g. of carbohydrate in its uncooked state, judged according to the food tables of Atwater and Bryant. This is the usual way of ordering the food in a diet. It was then realised that it would be more satisfactory to know the exact amount of carbohydrate given, and in subsequent experiments an estimation of the carbohydrate content was made on a sample of the food after preparation. Later on estimations were made on the cooked food used in these early experiments, the methods of cooking being repeated as closely as possible, but the values obtained in the case of potatoes and carrots varied so much that only a rough approximation of the actual carbohydrate given could be made. Table I. illustrates this point. Fortunately, the bread used, which came from the hospital bakery, was found to be of almost constant composition.

In comparing results, both the height and the duration of the rise of blood-sugar should be considered.

FIG. 2 (Case 5).



Shows rise in blood-sugar after the test-meal plus 1 oz. bread and after the same meal plus 1 oz. Energen bread. Both meals contained almost equal amounts of carbohydrate. The area between the curve and the base-line represents the total rise. The base-line represents the initial fasting blood-sugar.

For the sake of convenience this is referred to as the total rise. The amount of carbohydrate given must also be considered and the total rise per gramme of carbohydrate determined by dividing the total rise by the number of grammes of carbohydrate given. The total rise referred to above is measured from the area between the blood-sugar curve and the base-line drawn through the fasting value, but the following method of calculating the total rise adopted, while not absolutely accurate, is sufficiently close for the purpose. The rise of blood-sugar over the initial value expressed as milligrammes per cent. is found for each quarter hour after the start of the meal, and the sum of these is taken as the total rise. If, for any reason, the estimation was missed at any given quarter hour the average of the preceding and succeeding quarter hours was used. In a few cases where the blood-sugar had not returned to normal when the experiment was stopped, an addition was made, based on rate of fall in progress at the end of the experiment; in no case did this addition make any substantial difference to the results.

Results.—Table II. gives the figures obtained in subjects 1 and 2, while Table III. gives those in subjects 3, 4, and 5. In subject 4 the experiment was inadvertently carried into a menstrual period. The fasting blood-sugar in three experiments were 0·139, 0·140, and 0·137, against 0·109, 0·104, and 0·108 in previous experiments. As this would indicate a temporarily decreased tolerance, the results are not strictly comparable. In order to be able to bring the results together, the average rise per gramme with 1 oz. of bread in each subject has been called 100, and the remaining results expressed as a percentage of this, as shown in Table IV.

TABLE II.

Food.	Weight.	Carbohydrate. Expected from table.	Carbohydrate. Later analysis.	Total rise.	Rise per gramme of carbohyd.
Subject 1.					
Bread	1 oz.	15	15	1200	80
Bread	"	15	15	1125	75
Tomatoes, fried	16 oz.	15	—	1005	67
Tomatoes, fried	"	15	—	870	58
Carrots, old, boiled*	6½ oz.	15	6·2	136	38
Carrots, young, boiled†	"	15	10·6	106	10
Potatoes,	3 oz.	15	13·2	569	42
Potatoes, young, boiled†	"	15	13·2	308	23
Salad, raw	—	15	—	195	13
Strawberries, raw	—	15	—	345	23
Subject 2.					
Bread	1 oz.	15	15	390	26
Tomatoes, fried	16 oz.	15	—	435	29
Cabbage, steamed	12½ oz.	15	—	390	26
Turnips, boiled	8 oz.	15	5·4	111	21
Artichokes, steamed	3½ oz.	15	—	135	9

* In slices. † Whole.

TABLE III.

Food.	Weight given.	Carbohyd. content.*	Total rise.*	Rise per g. carbohyd.
Subject 3.				
Bread	1 oz.	15	870	47
Bread	1 oz.	15	645	34
Bread	2 oz.	30	1260	37
Rusks	1 oz.	15	285	15
Rusks	1 oz.	15	405	21
Rusks	1 oz.	15	435	23
Turnips	22 oz.	12	384	24
Apple	10½ oz.	6·7	214	20
Apple	7 oz.	21	567	23
Subject 4.				
Bread	1 oz.	15	375	20
Bread	2 oz.	30	660	15
Rusks	1 oz.	15	285	15
Rusks	2 oz.	30	630	18 (*a*)
Oatmeal	—	13·1	293	17 (*a*)
Subject 5.				
Bread	1 oz.	15·8	558	32
Bread	1 oz.	16·7	500	27
Rusks	1 oz.	14·8	441	27 (*b*)
Rusks	1 oz.	16·4	586	33 (*b*)
	1 oz.	15·2	89	5·4
Energen bread	1 oz.	15·2	282	17
Energen bread	1 oz.	15·2	260	15·5

* In subjects 3 and 4 the meal contained 4 g. of carbohydrate as milk in tea, and in subject 5 1·5 g. of carbohydrate.

Remarks.—(*a*) Menstruating. (*b*) Fasting blood-sugar unusually low.

TABLE IV.

Food.	Subject used.	Rise per gramme per cent.	Average.
Bread, 1 oz.	1, 2, 3, 4, 5	100	100
Bread, 2 oz.	3	91	93
Bread, 2 oz.	4	95	
Rusks, 1 oz.	3	37, 52, 57	71
Rusks, 1 oz.	4	75	
Rusks, 1 oz.	5	92, 111	
Rusks, 2 oz.	4	90	90
Energen bread	5	18, 58, 52	43
Oatmeal	4	85	85
Turnips, boiled	2	82	63
Turnips, boiled	3	59, 49	
Tomatoes, fried	1	87, 75	91
Tomatoes, fried	2	112	
Cabbage	2	100	100
Potatoes	1	54, 30	42
Carrots, old	1	50	50
" young	1	13	13
Artichokes, boiled	2	35	35
Apples, raw	3	57	57
Strawberries, raw	1	30	30

Discussion.

It will be seen from Table IV. that many carbohydrate foods give a definitely smaller rise per gramme of carbohydrate than does bread. With the exception of tomatoes and turnips, all fruits and vegetables tested gave a rise of about 50 per cent. or less. Of the cereal foods used, oatmeal showed a figure slightly below 100 per cent. on the one occasion it was examined. Rusks gave a varying response, but on the whole showed a definitely smaller rise per gramme than bread. Energen bread, which contains as much carbohydrate in an ounce as bread, gave, in three experiments on one subject, a rise of about half that of bread.

The cause of this lessened rise might be due either to failure to absorb the carbohydrate or to the rate of absorption being slower. Evidence on this point was obtained by examining the fæces in subject 5. On a diet containing 1½ oz. of bread, but no vegetables, 0·3 g. of carbohydrate was lost per day in the fæces. When 1½ oz. of Energen bread was given instead, the amount of carbohydrate lost was 0·37 g. There was thus no failure in absorption. This was further confirmed by comparing the blood-sugar level of the patient when on the two diets.

Bread.	Blood-sugar per cent.	Energen bread.	Blood-sugar per cent.
May 4th, 1927—		April 27th, 1927—	
11.15 A.M.	0·084	11.10 A.M.	0·099
3.10 P.M.	0·086	—	—
5.30 P.M.	0·107	5.30 P.M.	0·109
May 9th, 1927—		April 29th, 1927—	
11.30 A.M.	0·083	11.15 A.M.	0·086
3.5 P.M.	0·091	3.10 P.M.	0·097

It will be seen that there is practically no difference between the two sets of figures, suggesting that the same amount of carbohydrate was absorbed in each case. It is possible in the case of uncooked fruits and vegetables that, owing to their structure, a certain amount of carbohydrate is not absorbed.

Conclusion.

1. Certain carbohydrate foodstuffs cause less rise of the blood-sugar per gramme of carbohydrate than do others. (2) This is probably due to a slower rate of absorption.

My thanks are due to Dr. E. P. Poulton for much advice and practical help, and to Dr. Robert Hutchison and Dr. Poulton for permission to use their patients for the experimental work. I also wish to thank the various subjects who cheerfully submitted themselves to the discomforts of the experiments.

AN OPERATION FOR THE ALLEVIATION OF DEAFNESS.

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IN 1919, while serving in the Indian Medical Service and acting as surgical specialist of the Mhow Division, I was approached by many people suffering from deafness, and was unable to help them.

One day I found in the cantonment hospital in Jubhulpore a fine old Sikh of 65 or more lying on the operating-table; he refused to move until I had operated on him, as this was his lucky day. About a month previously I had extracted both his cataracts, and he could see perfectly, so he believed that the cure of his deafness was an easy matter. I had many times refused to operate, explaining that the eye was on the surface, and the organ of hearing hidden at the bottom of a long narrow canal embedded in the skull. It was these discussions that finally suggested to my mind the operation here described.

He was very importunate and had indeed taken an oath of starvation unless I operated, and so I asked

the doctor babu to give him chloroform and operated on both ears. The man made an excellent recovery, and went home both seeing and hearing. This brought me such a stream of similar sufferers that I did not know how to cope with them.

The fundamental idea of the operation is simple. When deafness is due to obstruction of the Eustachian tube the treatment is to make a new passage leading from the exterior into the cavity of the middle ear behind the ear-drum.

The Operation.

The skin behind the ear is painted with tincture of iodine and a light general anæsthetic given, preferably chloroform, which ensures less bleeding. ½ per cent. phenolaine* (a local anæsthetic) is injected subcutaneously, and an incision is made close behind the pinna. When the periosteum is reached phenolaine is injected under it and also between the cartilaginous canal and the bony meatus. The periosteum is incised and separated from the bone with a raspatory, all redundant periosteum being cut away. McEwen's triangle is located, and a retractor inserted, so as to pull the pinna forward. All the vessels on the posterior flap are clamped, while those on the anterior are compressed by a small wad of cotton-wool under the retractor.

A hole is then bored over McEwen's triangle with a hand gouge 11 mm. in diameter. The boring is continued in a direction which cannot be previously defined, as it must follow the line of least resistance, skirting in front of the lateral sinus. There is a thin dense wall of bone lining the sinus, which can always be seen as a dark blue mark. Finally, depending upon the anatomy of each case (and all are different), an occasional cell is reached about 10 mm. from the surface; though less frequently there are cells 2 mm. from the surface. The 11 mm. gouge is used till a thinness is noticed at the bottom of the boring. A 7 mm. gouge is now used, and the boring, or rather filing or scraping process, is continued until the thin wall of the antrum, or attic of the middle ear, is reached and gently scraped away. The first opening to appear is probed to discover whether it is only a cell or a larger cavity leading into the middle ear; the excavation is continued till a definite opening of about 5 mm. diameter is produced. A strong probe with a short right-angle bend is inserted and the thin wall between the antrum or middle ear (as the case may be) and the boring is broken away by pulling outwards. A fine probe, bent at an angle of 45° at the tip, is carefully passed at the bottom of the boring towards the middle line to ascertain if the attic of the middle ear has been entered. Great care is taken not to disturb the processus gracilis of the malleus. The total depth from the surface of the skull to the bottom of the attic is 22 mm.

The posterior portion of the cartilaginous canal is now separated from the osseous canal, and the ridge of bone between this canal and the boring is scraped away with the 11 mm. gouge for about 5 mm. The cartilaginous canal is divided transversely at the level of the ridge and two longitudinal incisions are made so as to reflect a flap of the canal outwards. A broad director is inserted through the external auditory meatus under the flap, and the incisions are continued, till the external auditory meatus will admit the tip of the little finger.

The flap is now sewn with catgut to the under surface of the reflected skin, so as to keep the widened meatus patent, and stop bleeding.

Two suitable rubber tubes are now inserted from the external meatus to the bottom of the boring.

The incision at the back of the ear is closed with horsehair, a small opening being left at the bottom for drainage. The ear is smeared with carbolised (1 per cent.) vaseline and a dressing applied behind it.

A hammer is never used as the bone is extraordinarily variable in density. In old-standing cases it is ivory-hard and there are no cells, while the lateral sinus forms a bend towards the external auditory canal. The facial nerve runs no risk, while the lateral sinus can always be seen. The dura mater is occasionally seen when the bone is very dense; this is when the cranial cavity comes lower down than usual, to fill the space normally occupied by the mastoid cells.

After-treatment.

The tubes are syringed out and one is removed on the first day; on the second day the remaining tube is removed and the cavity plugged with narrow ribbon gauze. The gauze is removed twice a day and the cavity syringed out either with 1 in 4000 perchloride of mercury or with biniodide, or with a weak solution of hydrogen peroxide, or hypochlorite.

By the end of a week the cavity discharges a good deal of mucus. The orifice is kept patent with gauze plugging, which is renewed once or twice a day for three weeks. On each occasion that the plugging is removed the cavity is syringed out with a weak antiseptic. Special care should be taken to inspect the bottom of the boring with an auroscope, so as to keep the foramen open which enters the middle ear; this is about 18 mm. from the surface. By the end of the third or fourth week mucous membrane lines the boring and joins with the skin of the external auditory canal. After a month or so the patency of the external opening is maintained by using a large lacrymal probe. The patient usually goes home at the end of the third or fourth week. A thin membrane, almost like tissue paper, often forms across the opening after some weeks and may require to be pierced every now and then if the hearing diminishes.

The result of the operation is to produce a new air passage to the middle ear. This incidentally opens the Eustachian tube, as the middle ear is now no longer a closed cavity, and so the patient can easily blow air through the Eustachian tube via the middle ear and out by the extreme auditory meatus. The middle ear is also drained, and the mucous membrane rendered healthy.

Clinical Records.

CASE 1.—Woman aged 42. One ear was absolutely deaf due to total removal of the ossicles, ear-drum, &c., seven years previously. The other ear became slowly deaf, till finally she could not hear any conversation unless she saw the lips moving. She could not hear a tuning-fork held in front of her ear, but could hear it for a short time when it was placed on the mastoid. As she is a school mistress her deafness was a calamity. I operated in 1922. Six months afterwards she found no improvement and attended a school for lip-reading, as she felt there was no hope. Personally I was hopeful, because she heard me call out her name when her back was turned to me. A year later the improvement was noticeable to her sister, but the patient herself would not admit it. Four years after operation the improvement was so marked that she answered numbers and single words spoken in a moderate voice in the dark and in the open air 12 yards away. She is not now noticeably deaf.

CASE 2.—Woman aged 29. Had steadily grown more deaf for six years, until finally she was too deaf for ordinary conversation, and never attempted to hear unless the speaker spoke close to her ear. In 1923 I operated on both her ears. In 1924 she reported very considerable improvement. In 1926 she wrote to say she was no longer deaf and was very happy, and was getting married on the strength of her restored hearing.

CASE 3.—Woman aged 68. She had given up all social functions, as she could only hear with a speaking-tube. In 1925 I operated on both her ears with a month's interval. Her improvement was so marked in six months that she was again able to take up the social duties her position entailed.

CASE 4.—A masseuse aged 50; operation 1922. She could not even hear a tuning-fork on the mastoid, nor a motor horn nor church bells. I operated on both ears with a week's interval. After three months she heard a tuning-fork on the mastoid and a motor horn blown close to the ear. She practised hearing every day through a cardboard cylinder and a laryngophone. In a year's time she was able to hear quite well with a powerful electrical instrument. In two years she was able to hear the organ in church and also the choir. Now, with the help of a simple aid, she can hear ordinary conversation, and can very easily carry on her occupation.

Results.

I have operated on more than 200 cases, from the ages of 4 to 70 years. The results have been variable, depending upon the period of the deafness. The improvement in the hearing of many patients who have been deaf for 30 years has been astonishing, and no case has ever been worse after the operation. In many the deafness has been arrested, while in the great majority the hearing has been greatly improved.

Patients should be inspected periodically, wax and debris removed from the external canal, and perhaps the thin membrane punctured. Dr. Bordley, of Baltimore, has injected an antiseptic fluid several times into the middle ear through the passage I had made in the case of one of my patients. She is an American lady of 64, and she has written to say that she has been much benefited by the treatment. In this direction there is still plenty of scope for

Martindale.

research. I look upon a period of one to two years after the operation as essential for estimating the result. Many patients find a great improvement after the first month if not sooner, but more generally it appears after six months.

The best results are obtained where deafness is due to blocking of the Eustachian tubes with indrawn ear-drums. One might term this condition "throat deafness," resulting from neglected tonsils and adenoids, with a narrowed nasopharynx and high palate. Such patients are frequently very deaf, almost stone-deaf, and they suffer from very distracting noises in the head. In four extreme cases the patients had almost lost their speech, as they could not hear their own voices. Many patients of this type have a typical deaf voice, a typical adenoid expression, and a difficulty in breathing through the nose. The improvement naturally depends on the length of time the deafness has been present.

Less favourable cases are those in which the Eustachian tubes are patent and the nasopharynx large. I have operated on many cases of otosclerosis; the mastoid portion of the temporal bone is very brittle and there are many large cells. These cases are not very favourable, but even some of them have been improved.

A CASE OF
SUPPURATING DERMOID OF THE CEREBELLUM.

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THE following case is of interest on account of the rarity of cerebral dermoids and because of the bacteriological findings in the blood and cerebro-spinal fluid.

The Clinical History.

A girl, aged 1 year 9 months, was admitted to the Borough Hospital on Jan. 29th, 1927, as a case of diphtheria, owing to redness of the throat with a croupy cough. She had been quite well and intelligent until one week before admission, when she appeared ill, vomited suddenly, screamed constantly, and complained of pain in her head and limbs; the parents noted some stiffness of her head and neck.

She was born with a small hairy cyst over the external occipital protuberance. When 6 months old she fell on the back of her head; after this the cyst grew larger and started discharging purulent matter. It was removed at the Croydon General Hospital on July 12th, 1926, but the wound kept discharging for one month.

Condition on Admission.—The child was fretful and restless, with occasional spasmodic cough. The throat was injected, but clean. Temp. 102° F., pulse 128. There were no signs in the chest, and no rigidity of head, neck, or limbs. During the night she was restless, with screaming attacks lasting for 20 minutes; she appeared to have pain in her head, but was quieter the following day. On Feb. 1st she was worse, with rigidity of the head and neck and some retraction. She strongly resented examination and screamed incessantly. Her pupils were equal, reacting sluggishly to light; reflexes present, no Babinski but double incontinence. On lumbar puncture 25 c.cm. of turbid fluid under pressure were withdrawn. After this she was quieter and slept for some hours and her temperature fell to normal. Next day she was better and the rigidity and head retraction had disappeared. On Feb. 4th she again became restless, screaming constantly; stiffness of neck and head retraction were marked, but limbs flaccid. Tâche cérébrale noted. A second lumbar puncture yielded 16 c.cm. of turbid fluid, not under pressure. On Feb. 9th she suddenly vomited, and this continued almost daily subsequently. The vomiting was not related to food. Subsequently her condition did not vary much. She was extremely irritable if approached, screaming at the slightest sound. When left alone she had crying attacks lasting for 20 minutes or longer, the cry resembling "cock-crowing" rather than a meningeal cry. The child did not appear to know anybody; she took her feeds eagerly, though occasionally there was dysphagia. The nervous symptoms were variable; on some days the head retraction and rigidity of neck and limbs was marked, with a fixed stare, the child being unable to turn herself in bed, and lying on her side with fingers clenched on palms and legs drawn up. At other times there was complete vascular relaxation throughout the disease, pupils were equal and reacting, reflexes present. There was incontinence of both rectum and bladder, and marked general wasting. About the middle of March the skin over the neck and chest turned almost black, and subsequently peeled in small flakes, leaving a clear skin below; this discoloration spread successively to abdomen, arms, and legs; concurrently there was marked growth of hair over the back of forearms and calves. After a few weeks the skin was normal.

On the morning of May 28th she collapsed, becoming cold, pale, and pulseless, with shallow respirations. She was soon revived with stimulants. During the following days she appeared weaker and drowsy, the spasms of crying were less frequent, but she was still very irritable and resented being touched. On the night of June 6th the child was very restless, screaming constantly, and she died suddenly at 1.10 A.M.

Temperature and Pulse.—Throughout the disease the child ran an irregular temperature which reached 102·6° F. at first and fell to normal by the end of the second week. After this it kept almost normal, or subnormal, till March 22nd, when it started to rise irregularly with variations of 3° in 24 hours. It was normal by April, became irregular on May 21st, with marked variations, until about a week before death, when it was subnormal. The pulse was rapid and weak, imperceptible at times, and became slow and irregular during the last fortnight.

Bacteriological Findings.—Lumbar puncture was performed six times between Feb. 1st and April 7th at periods when there was marked rigidity of head and neck. The quantity of cerebro-spinal fluid withdrawn varied between 25 c.cm. on the first occasion and only a few c.cm. on the last occasion. It was turbid and under pressure on Feb. 1st and 26th, but only slightly turbid and not under increased pressure at other times. It did not reduce Fehling's solution. Microscopically it showed excess of polymorphs and a Gram positive diplococcus, which was also cultured from the blood. It formed slightly raised white colonies on agar, tending to run together with crenation at margin. Mannite, lactose, insulin, and salicin were unchanged; gelatin was liquefied, milk turned slightly alkaline and glycerine slightly acid. It formed acid with glucose, maltose, and cane sugar. These results were confirmed by Prof. J. C. Ledingham.

Summary of Post-mortem Findings.

Brain.—The brain was œdematous and the ventricles distended with excess of cerebro-spinal fluid. It weighed 29 oz. There was no visible exudate on vertex or base, and membranes were not thickened.

Cerebellum.—A white cyst of the size of a hen's egg occupied the greater part of the right cerebellar hemisphere. On section it had smooth laminated walls and a quantity of thick yellow pus was evacuated. It also contained a coil of brownish fine hairs. The cyst was not adherent either to the skull bones or the cerebral membranes. All the skull bones appeared normal. Except for slight congestion of the kidneys and spleen all the other organs appeared normal. The cyst wall was composed of fibrous tissue and hairs were present. There was some round-celled infiltration of the cerebellar abscess. The following cranial dermoids are on record:—

A man[1] 22 years old, who died at Fort Pitt, was found to have a congenital encysted tumour with semi-fluid contents under the integuments covering the frontal sinus. The cyst contained oil globules and hairs.

A boy[2] 2½ years old who suffered from squint and convulsions of body and limbs following a fall off a chair later became comatose and died. He had a cyst of the dura mater on the posterior part of brain causing a depression in the occipital bone. The contents were composed of opaque white substance and purulent material, and in many places mixed with fine hairs collected together in a lock.

A girl[3] aged 7 had been suffering from increasing loss of power in lower extremities and had fallen violently on the back of her head two years before admission to Charing

Cross Hospital. Post mortem an abscess was found which had invaded the greater part of both lobes of cerebellum. It contained purulent material, was lined with a cheesy layer of sebaceous matter, and contained a tuft of hair rolled in a coil. The abscess was a suppurating dermoid of the cerebellum.

A boy [4] 4 years old, with a year's story of fits and paroxysmal attacks of headache and vomiting, was admitted to the Royal Free Hospital, dying there three months later. He was well during the greater part of the time, except that at intervals of two to three weeks he had attacks of severe frontal headache and vomiting lasting a few days. A bright yellow tumour was found in the orbital surface of the frontal lobe in front of the optic chiasma. It had a definite wall containing numerous hair follicles and active sebaceous glands.

A man,[5] 75 years old, who had been an epileptic and had been in an asylum for 38 years, had a tumour in the frontal lobe which contained fat and epithelial cells in the centre, while in its walls were skin, hair, sebaceous glands, cartilage, elastic tissue, and muscle.

Laumalogue [6] describes a cerebellar cyst the size of an orange containing a yellowish-white granular mass and many curled hairs. It was adherent to the occiput by a fibrous band which was lost in the bone.

Conclusion.

Dermoids of the brain are very rare; they occur at all ages and often suppurate. Trauma appears to be a factor in causing them to grow. They often give rise to headache, vomiting, fits, and convulsions, but not to paralysis of limbs. Progressive mental dullness and drowsiness ending in coma are common sequelæ.

In the case now recorded there was also extreme irritability to touch and sound, a constant peculiar cry resembling "cock-crowing" rather than a true meningeal cry, marked general body wasting and double incontinence. It is interesting to note the intermittent character of the rigidity of head and neck and stiffness of limbs; there was never any change in the reflexes nor were Kernig's sign or ocular paralysis present, which they probably would have been had the child been suffering from meningitis.

The micro-organism recovered from the blood and cerebro-spinal fluid was not one of those usually found in meningitis, as was confirmed bacteriologically, though the cerebro-spinal fluid was turbid and under pressure. It is difficult to account for the curious darkening of the skin followed by desquamation which developed during the third month of illness. The congenital cyst over the occiput which was removed six months before admission to the hospital was presumably a dermoid which, according to the history, started growing after a fall on the head. This may have caused the cerebellar dermoid to grow at the same time. The specimen of the brain from this case is now in the museum of the Royal College of Surgeons of Engl.nd, Lincoln's Inn Fields.

I wish to thank Dr. H. P. Newsholme, medical officer of health for Croydon, for permission to publish this case; Prof. J. C. Ledingham for confirmation of the bacteriological findings; and Dr. H. W. Southgate for the pathological report.

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A "ROYAUMONT BED" AT THE ROYAL FREE HOSPITAL.—Recently the French Ambassador presented the nameplate of a bed bearing this designation. The cost of its endowment, £1000, has been raised by the Scottish Women's Hospital Association of the "Royal Free," an organisation founded in 1921 to raise money for the endowment of beds in the obstetric and gynæcological unit. A secondary object was to commemorate by a permanent memorial the work of the Scottish women's hospitals during the war. This is the sixth bed which has been similarly endowed.

Clinical and Laboratory Notes.

THE VALUE OF SODIUM TETRAIODOPHENOLPHTHALEIN IN STEARIN CAPSULES AS AN INDICATOR OF PANCREATIC OBSTRUCTION.

BY SPENCER MORT, CH.M., M.D. GLASG., F.R.C.S., F.R.S. EDIN.,
LIEUT.-COLONEL, LATE R.A.M.C.; SURGICAL DIRECTOR, NORTH MIDDLESEX HOSPITAL, EDMONTON; LATE ASSISTANT PROFESSOR OF SURGERY, GLASGOW UNIVERSITY.

WORKERS at the North Middlesex Hospital have for some time pursued a series of investigations on the surgical diagnosis of affections in the region of the liver, using salts of sodium tetraiodophenolphthalein or sodium tetrabromophenolphthalein.

Technique.

The technique of administration of these drugs is well known. The stomach and intestines are emptied by a suitable purgative, and the salt is administered in the evening, 12 hours before the X ray photograph is taken,

Radiogram showing shadows cast by stearin capsules of sodium tetraiodophenolphthalein in the cæcum in a case of pancreatic obstruction. (Radiograph by Mr. H. C. Mayle, M.S.R.)

just before retiring to bed. The patient is asked to sleep, if possible, on the right side. In certain cases X ray plates are taken again about 16 hours after administration, when a clear picture of the size, condition, and situation of the gall-bladder is seen and stones may be very easily detected.

We give this preparation, usually the iodine salt, by the mouth in the form of powder, in doses of 40–60 grains, without any toxic effect, the dose varying with the body-weight of the patient. The preparation we use is made by Messrs. Duncan, Flockhart and Co., Edinburgh. We have also given the drug in tablet form (Martindale's gelatin-coated "slipules iodoray"). Messrs. Boots recently supplied a sample under the name "cholumbrin," which is a stearin-coated capsule containing 7½ grains of the active substance, which passes intact through the stomach and dissolves under the action of the pancreatic juice in the small intestine. This averts gastric irritation.

A lady, aged 69 years, was referred to me recently by Mr. James McClure for diagnosis and treatment. She was given 10 capsules, each containing half a gramme of cholumbrin, and at the appropriate time she was X rayed. The salt did not appear to be excreted by the gall, and the capsules were passed into the large intestine, as is seen in the figure, where a number are seen lodging in the cæcum; one has passed through the greater part of the intestine, and is about to enter the sigmoid.

The abdomen had been carefully examined, and a tumour detected on the right side. In addition, there was well-marked jaundice, obviously due to obstruction of the bile-ducts. The X ray plate, with intact capsules, was puzzling. The patient had taken only half a pint of fluid after the capsules. It might be

that there was not sufficient fluid in the stomach and intestines to dissolve the coating, but I felt sure that there must be some form of intestinal juice which would dissolve it, and came to the conclusion that the obstruction must be in the region of the ampulla of Vater, causing deficiency not only in bile flow, but also in the pancreatic juices, especially steapsin.

I operated on the patient on Oct. 10th, 1927, assisted by Mr. R. L. Galloway, and the anæsthetic —nitrous oxygen and oxygen—was given by Dr. F. P. de Caux, anæsthetist to this hospital. The record of operation was as follows :—

A transrectus incision was made on the right side above the umbilicus, and the peritoneum opened. Quite a large quantity of free bile-stained fluid escaped. The exploring hand revealed small, hard, carcinomatous areas scattered through the whole of the omentum. The liver was very large, but no actual involvement could be seen. The gall-bladder was hugely distended, and its whole surface was covered with small cancerous nodules. The hilum of the liver was filled with growth, and the retroperitoneal tissues in the region of the pancreas showed the same condition. A diagnosis was made of general carcinomatosis of the abdominal organs, with the origin in the head of the pancreas. The abdomen was closed in layers without drainage. The wound healed, and the stitches were removed on the tenth day ; the patient was well, and the colour of the skin rapidly improved. The jaundice probably passed away as the result of manual dislodgement of mucus during the operation. Patient discharged, much improved, in 21 days.

Remarks.

An old-fashioned rough-and-ready method of diagnosis in pancreatic obstruction was to give a dose of castor oil and watch the result to see if the oil passed through undigested. A refinement of this was to give wax-coated capsules of methylene-blue. If there were pancreatic obstruction the urine would be uncoloured ; but in the absence of obstruction the capsules would dissolve, and the methylene-blue would rapidly make its appearance in the urine. In this case the capsules were similarly undissolved, denoting pancreatic obstruction, in association with the more obvious sign of biliary obstruction, but, fortunately, *the material is quite opaque to X rays, giving visible evidence.*

As I have not seen any record of this observation in the literature of abdominal surgery, I am desirous of bringing this matter to general attention.

A NOTE ON
BLOOD TRANSFUSION IN SYRIA,
WITH AN ANALYSIS OF 1149 BLOOD GROUPINGS.

BY E. H. R. ALTOUNYAN, *M.C.*, M.D. CAMB.,
ASSISTANT SURGEON, THE ALTOUNYAN HOSPITAL, ALEPPO.

THE adoption of blood transfusion as a routine measure in hospitals is still far from universal, but soon there will be no justification for the practice of surgery where facilities for transfusion do not exist. In the Near East the wide prevalence of severe secondary anæmia due to chronic malaria gives a further incentive to the use of transfusion.

In a recent series of 145 transfusions in the Altounyan Hospital, Geoffrey Keynes's method for citrated blood alone was used. Some such method must always be preferred for emergency work in general hospitals, reserving the possibly more efficient, and admittedly more difficult, use of non-citrated blood for the treatment of anæmia and other "medical" conditions. It is true that 50 per cent. of my series had well-marked rigors, but I have seen a severe reaction after the transfusion of 200 c.cm. of non-citrated blood with a Becart-Pauchet syringe, while no deleterious effect of citrate on the blood count was observed. A pint of citrated blood ready for instant infusion may permit the successful removal of a dangerously adherent spleen, which would otherwise be abandoned as inoperable. Hybrid methods, employing paraffined tubes with "just a little citrate" added, have little to recommend them.

Blood Transfusion Service.

Every patient on admission is grouped and the group is noted in a prominent place on his chart. He is then asked to name a friend as donor or, alternatively, to deposit £2 to provide for a professional should occasion arise. The practice of blood-letting once or twice a year at the village barber's still prevails in this country, but the popular imagination which accepts the homely sweep of a dirty razor seems dismayed at the surgeon's array of shining needles. In this series about 40 transfusions were provided by the patients' friends.

Professional donors are entirely drawn from Armenian refugees and all healthy men and women under 40 are accepted. Active syphilis is excluded by a Wassermann or Sigma reaction ; in 117 blood examinations of apparently healthy candidates, 12 per cent. were strongly positive. The largest quantity of blood withdrawn at one time was 650 c.cm. One girl, aged 20, gave 450 c.cm. twice in one week without serious disturbance to her health.

Table giving Analysis of 1149 Blood Groupings.

Race.	Group 1.	Group 2.	Group 3.	Group 4.
Arabs	32 (5%)	216 (37%)	129 (22%)	212 (36%)
Armenians ..	23 (5%)	230 (53%)	56 (13%)	129 (29%)
Jews	9 (7%)	46 (38%)	19 (16%)	48 (39%)
General population	64 (5·5%)	492 (43%)	204 (17·5%)	389 (34%)

The table gives the blood group percentages of the three races that form the principal components of the Syrian population. In this country the Jews and Armenians represent almost pure racial groups, with little admixture of foreign elements. Under the heading of Arab are included some Turks, Kurds, and a few Greeks, as well as the nomad and town-dwelling Arabs. It is interesting to note that there is an appreciable difference in the percentages of Groups 2 and 4 given by the Armenians, on the one hand, and the Arabs and Jews on the other.

Technique.

The methods and apparatus described in Keynes's book on "Blood Transfusion" (Oxford Medical Publications) have been used throughout. The most difficult part of the procedure and the most important, if a supply of donors is to be maintained, is the painless withdrawal of blood. The following technique is in use at this hospital :—

1. A sphygmomanometer is wrapped round the arm well above the elbow.
2. An intradermal wheal, 2 mm. in diameter, is made with 2 per cent. novocaine immediately over the selected vein.
3. A very fine hypodermic needle, mounted on an empty 2 c.cm. syringe, is introduced at one edge of the wheal, picking up but not piercing the anterior wall of the vein, and re-emerging through the wheal at its opposite edge. The syringe is then disconnected.
4. A vertical nick of 1 mm. is made with a sharp-pointed scalpel through the wheal immediately below the transfixing needle.
5. A Keynes's needle sterilised in paraffin is slowly introduced into the vein and the blood led off by a rubber tube into a Keynes's flask containing 2 g. of sodium citrate dissolved in 50 c.cm. of distilled water.

Blood Grouping.

Out of 1149 groupings performed during the last two years, three cases of abnormality have been noted.

1. Auto-hæmagglutination occurred twice. At room temperature the serum of the patient agglutinated his own red blood corpuscles. This did not occur if the slides were placed immediately in the incubator at 37° C. One was a boy, aged 16, suffering from splenic anæmia. After splenectomy, and coinciding with an improvement in his general health, his blood reacted normally. The other was a man of 30 suffering from profound secondary anæmia, due to hæmorrhoids, and early malignant disease of the rectum. Both patients were transfused without ill-effects.

2. A girl, aged 20, suffering from advanced pulmonary tuberculosis from which she died a year later, belonged apparently to Group 2. Her serum was tested against the red corpuscles of a donor of the same group, and marked agglutination was noted. The test was repeated on two different occasions with identical results. In all ten

different donors, some of them belonging to Group 4, were tried, and finally it was decided not to transfuse the patient.

A man with advanced pulmonary tuberculosis, and a woman suffering from advanced cirrhosis of the liver, with ascites and splenomegaly, also appeared to present the same abnormality, although they could not be investigated as fully as the first case.

This part of the work was carried out by Miss Setyan and Miss Meryack in the hospital laboratory. The actual grouping tests of every patient transfused were seen by the doctor responsible for the transfusion. As an additional safeguard the serum of each recipient was tested directly against the corpuscles of the donor. The observance of these two precautions may save much remorse. Universal donors were seldom used.

A CASE OF MASSIVE TUBERCULOSIS OF THE LIVER.

BY W. P. H. SHELDON, M.D., M.R.C.P. LOND.,
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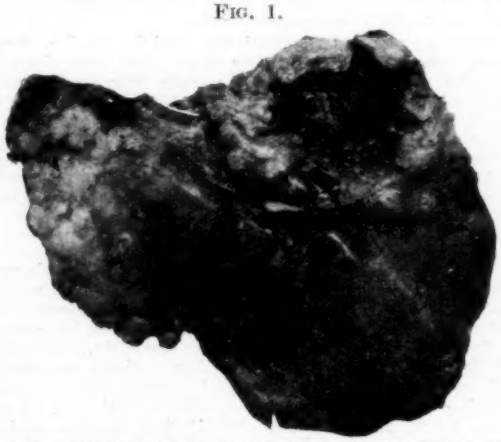
TUBERCULOSIS of the liver is generally seen in its miliary form when the liver becomes infected, in company with other viscera, as a terminal event to some tuberculous process elsewhere in the body. It is rare for chronic caseating tuberculosis to commence in the liver, and it is on this account, and also because of the difficulty of diagnosis while the disease was confined to the liver, that the following case is recorded.

The Case Related.

A boy, aged 11 years, was admitted to the Hospital for Sick Children under the care of Dr. Robert Hutchison in February, 1926, with a history that for six weeks he had suffered from sharp attacks of pain in the right hypochondrium. The pain occurred about 20 minutes after taking food, and often radiated up between the shoulder blades. During this period there had been three transient

FIG. 1.

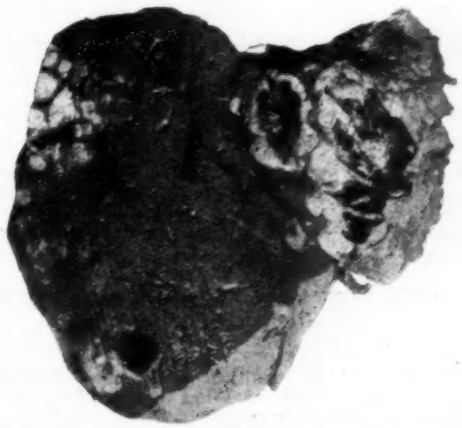


Posterior aspect of the liver, showing an abscess cavity in the right lobe and extensive involvement of the left lobe.

attacks of jaundice. A year previously the tonsils had been removed, otherwise the past history and family history were negative.

Condition on Admission.—The patient appeared delicate, with a clear complexion, free from any trace of jaundice. The lymphatic glands in the neck and in the right axilla were slightly enlarged. The heart and lungs were normal. There was some fullness in the epigastrium, the veins of the anterior abdominal wall were dilated, and the current in them flowed from below upwards. The liver was enlarged, but not tender, and extended two inches below the costal margin; the edge was grossly irregular and very firm, the surface felt coarsely nodular like a portal cirrhosis. The left lobe of the liver was well-defined, but the limits of the right lobe were ill-defined, especially deeply, towards the right renal region, where an indefinite mass could be palpated. The spleen was palpable half an inch below the costal margin, and felt quite smooth. There was no ascites nor œdema of the extremities. The urine was normal. The Wassermann reaction was negative; a blood count showed nothing abnormal beyond a slight secondary anæmia. The fragility of the red corpuscles was normal. A lævulose test (Dr. W. W. Payne) suggested a slight impairment of liver function, the figures being: blood-sugar before lævulose,

FIG. 2.



The cut surface of the liver. There is a big abscess cavity in the left lobe and another close to it. There is also a bile-stained cavity in the right lobe. Note the accumulation of small caseous areas in the right lobe just under the capsule.

0·084 per cent.; one hour after 35 g. lævulose, 0·110 per cent.; two hours after 35 g. lævulose, 0·107 per cent.

At first it was thought that the liver contained secondary deposits of malignant growth, the primary focus being in the region of the right suprarenal body; during the ensuing month, however, the clinical condition remained unchanged, and there was never any pyrexia; indeed, apart from the enlargement of the liver, the boy seemed to be in such good health that the diagnosis was altered to cirrhosis of the liver.

The patient was not seen again until October, 1926, when he complained that for two months his back had been aching. He was obviously thinner, but not jaundiced. The liver had not appreciably changed since February, but the spleen now reached the level of the umbilicus. There was still no ascites. The spine, in the mid-dorsal region, showed an early kyphosis, and the radiological report by Dr. Bertram Shires was that the body of the fifth thoracic vertebra was undergoing destruction and collapse with abscess formation.

The boy lived on for six months. During this time he had one attack of jaundice, which lasted a month and completely cleared up. The spinal deformity increased slightly, and signs of involvement of the right lung appeared. The liver and spleen remained unaltered. During the last two months there was a daily pyrexia up to about 101° F., and emaciation became profound. Eventually the symptoms of tuberculous meningitis appeared, and he died in April, 1927.

Post-mortem Examination.

The body only weighed 30 lb. The cranial contents showed the typical appearance of tuberculous meningitis. The bodies of the fourth, fifth, and sixth thoracic vertebræ were carious and had formed a large abscess, which was adherent to the adjacent pleura covering the upper lobe of the right lung. The lung in this part contained several small tuberculous cavities, and the rest of the right lung showed tuberculous broncho-pneumonia. The peritoneum was thickly studded with small cauliflower-like masses of caseous material; there was no ascites, nor were the intestines welded together into the conglomerate mass characteristic of advanced plastic tuberculous peritonitis. The spleen (weight 150 g.) was enlarged, and its capsule was covered with similar caseous tufts, but the spleen pulp was entirely free of tubercle formation. Both kidneys were enlarged (weight 120 g.), but contained no tubercles. The mucosa lining the stomach and intestines was normal; the mesenteric glands contained a few foci of miliary tuberculosis. The liver (weight 1250 g.) (Figs. 1 and 2) extended down to the umbilicus. Its surface was covered with caseous masses, while projecting from the liver substance through to the surface were many bosses of yellow tuberculous material. The left lobe was almost entirely occupied by a large abscess which was filled with a greenish-yellow liquid consisting of liquefied tuberculous pus, broken-down

liver substance, and bile. In this were suspended pieces of more solid caseous material. The walls of the abscess varied in colour from deep green to yellow, and were crossed by thick fibrous septa of supporting liver tissue. In the upper part of the right lobe of the liver was a similar abscess. In addition, the right lobe contained several smaller areas of solid yellow caseation, situated just under the capsule, suggesting that the causal organism had entered the liver through the peritoneal surface. The liver contained no miliary tubercles.

Microscopical examination confirmed the diagnosis of tuberculosis of the liver. In addition, one of the strands crossing the wall of the abscess in the right lobe proved, on section, to consist of tuberculous material and original supporting tissue of the liver around a patent blood-vessel.

Commentary.

The mode of infection of the liver in these cases is uncertain, but some writers have called the condition tuberculous cholangitis, holding the view that infection spreads by way of the bile-ducts. Others consider that the tubercle bacillus reaches the liver through the portal vein, and that the abscesses formed in the liver do not become bile-stained until rupture occurs into a bile-duct. Certainly in the case here recorded most of the smaller caseous areas showed no bile-staining. A third possible route of infection is by direct spread through the peritoneum into the liver substance; this route seems the most likely in the present case from the grouping of the younger caseous areas under the liver capsule.

Massive tuberculosis of the liver is a disease of long duration, and gives rise to no specific symptoms; even jaundice seems to be uncommon, owing to the small number of ducts usually involved, and until a secondary tuberculous process appears in some other part of the body the condition is likely to be mistaken for cirrhosis of the liver.

I wish to thank Dr. Hutchison for permission to publish this case.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

A MEETING of the President and General Council of King Edward's Hospital Fund for London, for the purpose of awarding grants to the hospitals and convalescent homes for the present year, was held on Dec. 13th at St. James's Palace, the Prince of Wales being in the chair.

Remarks by the Prince of Wales.

The Prince of Wales read the following message from the King: "The King is very glad to hear that King Edward's Hospital Fund is increasing its distribution from £245,000 to £247,000 with the help of the League of Mercy, who are contributing £17,000, instead of £15,000. His Majesty offers his congratulations to all concerned, and earnestly trusts that the Fund will continue to make the same steady progress in the years to come." For the last two years, said His Royal Highness, the ordinary distribution had remained at £245,000. This year it had been increased to £247,000. The quarter of a million was being approached. Another £2000 had been advanced this year because the League of Mercy were giving £2000 more. Without this extra £2000, a distribution of £245,000 only would have been maintained. The British Charities' Association were again giving £15,000. Only one large donation had been given to the general fund—namely, £8000 from an anonymous friend. But legacies showed an increase of £10,000, and income from investments had risen by £3000. The capital fund continued to grow. The largest donation added to investments this year was Mr. H. W. Marshall's gift of £10,000 Conversion Stock. The legacy of £60,000 bequeathed to capital by the late Lord Iveagh had, of course, not yet been received. The total distribution for 1927 was, however, not £247,000, but £281,500. For grants were being made of £34,500 out of the legacies of the late Mr. and Mrs. Wells for special purposes, particularly schemes of extension and improvement. The distribution of these legacies had not yet quite finished; but they had already helped to provide more than 1300 additional beds, including 144 beds for accident cases, which were becoming a problem for all hospital people. The report of the Distribution Committee dealt with another aspect of this problem—the best way of providing immediate medical attendance on accidents and other emergencies at the outlying hospitals, many of which were developing out of cottage hospitals into general hospitals. Some of these had resident medical officers, some had not. The Distribution Committee had studied the visitors' reports; they had had a conference with the principal hospitals concerned; they had formed their own views on the subject; they had circulated them to the hospitals; and they now recommended that the Council should publish them. But they had laid down no rules; they would for the present content themselves in most cases with asking each hospital each year if it was satisfied that its own methods were adequate. thus combining the influence of a voluntary central body with the freedom and responsibility of the separate voluntary hospitals. The figures in the report showed that hospital expenditure continued to grow with the increase in the number of beds. Hospital income decreased a little during 1926, which was a year of exceptional difficulty. The hospitals, therefore, had a deficit, for the first time since 1922. It was not large—only a little more than 1 per cent. of their expenditure. It was chiefly due to a falling off in legacies, which had gone back to the level of five years ago. One thing was very encouraging. In spite of all the industrial depression, the patients' contributions continued to grow, working men and women—and much credit was due to them—were coming forward splendidly to do their share; and if everybody else did the same, the finances of the hospitals with deficits would soon be put right.

The Pay Beds Committee which, under Lord Hambledon, was inquiring into the question of hospital accommodation for people who were above the ordinary income limits, had been steadily at work, and expected to present its report to the annual meeting of the Fund in April or May. The pensions scheme for nurses and hospital officers was now all but complete; and would begin on Jan. 1st next, with 89 London hospitals, representing more than 12,000 beds.

The Financial Statement.

Lord Revelstoke (the hon. treasurer) said this was the fourth year in succession in which the Council had made two distributions; that was to say, the ordinary distribution, and that represented by grants derived from the legacies of the late Mr. and Mrs. Wells. The former of these distributions amounted this year to £247,000, and the latter to £34,500, making a combined total for 1927 of £281,500. Last year, when £245,000 was distributed, it was anticipated that it would be necessary to make use of the whole of the £9000 which had been added to the reserves in 1925. But, owing to the receipt before the end of the year of some unexpected contributions, they were enabled to limit the withdrawals to about half of this amount. At the November meeting this year the estimates showed that, with the aid of this unemployed balance, it would be possible to maintain the distribution at £245,000. With regard to the Wells legacies, £214,240 had been received on account, which amount covered the grants already made to hospitals and those recommended by the Distribution Committee. Lord Iveagh, who had been a very good friend to the Fund, had left £60,000 to be applied to capital account. This generous bequest, together with Mr. H. W. Marshall's gift of £10,000 3½ per cent. Conversion Stock, would substantially increase the capital fund, and would benefit the income derived therefrom.

League of Mercy.

Sir William Collins, in making the annual statement on behalf of the League of Mercy, said that the bulk of the receipts of the League were derived from collections which had to be gathered fresh every year. The amount was therefore apt to vary. This year they were able to make the King's Fund a grant of £17,000, £2000 above the amount handed over last year. They were distributing £13,283 to extra-metropolitan hospitals, including £5000 given by the British Charities Association for that particular purpose. From 1899, when it was established, until now, the League had given to the King's Fund £415,034, and to the extra-metropolitan hospitals £100,697; making a grand total, which the League had received and distributed to voluntary hospitals, of £515,731.

Grants to Hospitals and Convalescent Homes.

The Chairman of the Distribution Committee (Sir Cooper Perry) presented the report of the committee on the distribution to hospitals (including recovery and convalescent branches) as follows, and moved the adoption of the list of grants. The report stated that the number of hospitals applying for grants is 141, as against 136 in 1926, new applications having been received from the Bermondsey Medical Mission, Croydon General Hospital, Harrow Hospital, Invalid Children's Aid Association, Heart Hospital at West Wickham, and St. Thomas's Cornwall Babies' Hostel. The accounts of all the participating hospitals taken together for the year 1926 showed that, while the total aggregate expenditure continued to increase, income showed a slight diminution, and there was, for the first time since 1922, a small aggregate deficit. The demands on the Committee have therefore continued to grow, and they were glad to have an increase, although a small one, in the amount available for distribution. The total grants recommended in aid of maintenance come to £211,450, as compared with £207,525 last year. The grants towards schemes of capital expenditure amount to £33,550 out of the ordinary distribution, as against £35,475 last year. The Committee are also recommending grants amounting to £34,500 out of the special distribution of the legacies of the late Mr. and Mrs. Wells. The total distribution to hospitals for the year is thus £279,500, besides £2000 to non-hospital convalescent homes. The Distribution Committee have been giving special attention not only to the provision of additional beds for accidents, but also to the question of the best method of securing prompt and efficient medical attendance, in cases of emergency, at hospitals which have no resident medical officer. This question has come before the Fund with increased importance for three reasons: first, the enlargement of the Fund's area, which has brought in several more small suburban hospitals; second, the tendency of such hospitals to grow in size, to take more serious operation cases, and to develop from cottage hospitals into general hospitals; and third, the increasing number of road accidents. Of the general or cottage hospitals with less than 70 available beds, 13 hospitals, ranging from 62 beds to 19, have resident medical officers. But 7 with from 40 to 55 beds are without a resident, as also are 14 with less than 37 beds. To some of these the Committee, while leaving the decision to the hospital, have expressed the view that the time has come for the appointment of a resident. The Distribution Committee have come to the conclusion that the most efficient system at such hospitals is one which includes: (*a*) the establishment of a rota securing the certain and most speedy attendance of one or more of the medical staff; (*b*) the appointment of one (or more) of the medical staff (either permanently or for a definite period) to pay daily visits to the hospital and make himself acquainted with the necessary facts concerning all the cases; (*c*) an arrangement whereby, in connexion with the rota, the member on duty undertakes to be available, or if unavoidably prevented, ensures that another member on the rota shall be available, and notifies the hospital to that effect. The hospital authorities thus always know beforehand who is the available member, and can communicate with him at once.

The Distribution Committee also consider that great importance attaches to the question of providing: (*d*) adequate facilities for taking notes on cases, whether medical or surgical, before deciding on a course of treatment. These conclusions have been notified to the hospitals without residents. Point (*d*) is even more important at these hospitals than at others, because the doctor who sees a patient under (*a*), (*b*) or (*c*) may not be the doctor under whose care he was originally admitted.

Lord Somerleyton (hon. secretary) presented the schedule containing the list of awards to hospitals (including recovery and convalescent branches) as follows:—

*List of Awards.**

	£
Acton Hospital	650
All Saints' Hospital	75
Babies' Hospital (Deptford Fund) (of which £250 towards rebuilding and extension on new site, in accordance with the scheme submitted to the Fund)	275
Baby Clinic Hospital (Kensington)	50
Beckenham Cottage Hospital	350
Belgrave Hospital for Children (of which £250 to deficit on new nurses' accommodation, in accordance with the scheme submitted to the Fund)	1,650
Bermondsey Medical Mission Hospital (towards erection of permanent wards, in accordance with the scheme submitted to the Fund)	50
Blackheath and Charlton Hospital	150
Bolingbroke Hospital (of which £500 towards extension, in accordance with the scheme submitted to the Fund)	2,250
Brentford Cottage Hospital (of which £500 towards rebuilding and extension on new site, in accordance with the scheme submitted to the Fund)	525
British Hospital for Mothers and Babies, Woolwich	550
Bromley Cottage Hospital	150
Carshalton and District Hospital	50
Central London Ophthalmic Hospital	500
Central London Throat, Nose and Ear Hospital	150
Charing Cross Hospital (of which £1,500 towards acquisition of adjoining building, and its adaptation as an extension of the hospital, in accordance with scheme to be submitted to the Fund)	5,500
Chelsea Hospital for Women (including Convalescent Home at St. Leonards)	900
Cheyne Hospital for Children (including Country Branch at St. Nicholas-at-Wade) (of which £100 to deficit on increased accommodation for artificial sunlight treatment and other improvements, in accordance with the scheme submitted to the Fund)	450
City of London Hospital for Diseases of the Heart and Lungs (Victoria Park) (of which £250 towards new surgical block, in accordance with the scheme submitted to the Fund)	3,750
City of London Maternity Hospital	1,250
Clapham Maternity Hospital	300
Croydon General Hospital	500
Dreadnought Hospital (Seamen's) (including Albert Dock Hospital, Hospital for Tropical Diseases, Sanatorium at Liphook, and Convalescent Home at Cudham)	1,525
East End Mothers' Lying-in Home (of which £500 to deficit on acquisition of adjoining building and its adaptation for nurses' quarters, in accordance with the scheme submitted to the Fund)	1,200
East Ham Hospital (of which £750 towards rebuilding as general hospital, in accordance with the scheme submitted to the Fund)	925
East London Hospital for Children (including Convalescent Home at Bognor) (of which £500 to reduce debt)	3,525
Elizabeth Garrett Anderson Hospital (including Recovery Branch at Barnet) (of which £1,000 towards extension, in accordance with the scheme submitted to the Fund)	2,450
Eltham and Mottingham Cottage Hospital	25
Enfield War Memorial Hospital	300
Evelina Hospital	1,100
Finchley Memorial Hospital	300
Florence Nightingale Hospital for Gentlewomen	300
Forest Hospital, Buckhurst Hill	200
French Hospital	350
General Lying-in Hospital (of which £1,000 towards new nurses' home, in accordance with the scheme submitted to the Fund)	1,600
German Hospital	350
Golden-square Throat, Nose and Ear Hospital	200
Gordon Hospital for Fistula (of which £100 towards recent improvements)	150
Grosvenor Hospital for Women	500

* The Distribution Committee desire to draw attention to the fact that it must not be assumed that the reduction or absence of a grant implies dissatisfaction.

	£
Guy's Hospital (of which £1,000 to deficit on recent improvements)	11,500
Hampstead General and North-West London Hospital	2,750
Hanwell Cottage Hospital	50
Harrow Hospital (of which £500 to extension, in accordance with the scheme submitted to the Fund)	650
Hendon Cottage Hospital (of which £100 towards X ray room and sterilising room, in accordance with the scheme submitted to the Fund)	400
Hornsey Central Hospital	150
Hospital for Consumption, Brompton (including Sanatorium at Frimley) (of which £250 towards improvements, in accordance with the scheme submitted to the Fund)	1,100
Hospital for Epilepsy and Paralysis	2,000
Hospital for Sick Children	3,500
Hospital for Women (Soho-square)	1,000
Hospital of St. John and St. Elizabeth	750
Hostel of St. Luke	100
Ilford Emergency Hospital (of which £500 towards extension, in accordance with the scheme submitted to the Fund)	1,000
Infants Hospital	350
Invalid and Crippled Children's Society's Hospital (Canning Town)	500
Invalid Children's Aid Association Heart Hospital, West Wickham (of which £250 towards erection of ward pavilion, in accordance with the scheme submitted to the Fund)	350
Italian Hospital	300
Jewish Maternity Home	50
Kensington, Fulham, and Chelsea General Hospital	100
King Edward Memorial Hospital (Ealing) (of which £1,000 towards extension, in accordance with the scheme submitted to the Fund)	1,450
King Edward VII.'s Hospital for Officers	300
King's College Hospital	7,500
Kingston-upon-Thames Victoria Hospital	100
London Fever Hospital	600
London Homœopathic Hospital (of which £200 towards recent improvements)	1,950
London Hospital (including Recovery Branch at Reigate) (of which £1,000 towards improvements, in accordance with the scheme submitted to the Fund)	16,150
London Jewish Hospital	300
London Lock Hospital (of which £600 to maintenance of Harrow-road Hospital and £100 to maintenance of Dean-street Hospital, and £500 towards the building of an extension of the out-patient department at Dean-street, in accordance with the scheme submitted to the Fund)	1,200
London Temperance Hospital (of which £100 towards recent improvements)	2,100
Medical Mission of the Good Shepherd, Babies' Home (Hoxton)	25
Metropolitan Ear, Nose and Throat Hospital	25
Metropolitan Hospital (of which £1,000 towards new nurses' home, in accordance with the scheme submitted to the Fund)	5,000
Middlesex Hospital (including Convalescent Home at Clacton) (of which £1,500 towards reconstruction, in accordance with the plans submitted to the Fund)	8,825
Middlesex Hospital Cancer Charity	1,250
Mildmay Memorial Hospital	350
Mildmay Mission Hospital (of which £500 towards nurses' home and operating theatre, in accordance with the scheme submitted to the Fund)	1,400
Miller General Hospital for South-East London (including Convalescent Home at Bexhill) (of which £1,000 towards extension, in accordance with the scheme submitted to the Fund)	4,575
Mothers' Hospital of the Salvation Army (of which £200 to deficit on extension, in accordance with the scheme submitted to the Fund)	800
Mount Vernon Hospital (Fitzroy-square and Northwood)	1,250
National Hospital for Diseases of the Heart (of which £300 to deficit on extension of out-patient department, in accordance with the scheme submitted to the Fund)	600
National Hospital, Queen-square (including Convalescent Home at Finchley)	3,750
Nelson Hospital (South Wimbledon) (of which £250 towards provision of maternity block, in accordance with the scheme submitted to the Fund)	950
Northcourt Hospital and Home for Sick Children (Hampstead) (in consideration of the fact that curable cases are admitted)	100
North Islington Infant Welfare Wards (of which £50 towards additional nurses' accommodation, in accordance with the scheme submitted to the Fund)	100
Norwood and District Cottage Hospital	375
Ormond Maternity Home	—
Paddington Green Children's Hospital (including Convalescent Home at Slough)	1,000
Passmore Edwards Hospital for Wood Green, &c.	100
Phillips Memorial Homœopathic Hospital, Bromley	20
Plaistow Maternity Hospital	500
Poplar Hospital for Accidents (including Convalescent Home at Walton-on-the-Naze) (of which £250 to deficit on provision of children's ward, in accordance with the scheme submitted to the Fund)	475
Prince of Wales's General Hospital (including Convalescent Home at Nazeing) (of which £1,000 to reduce debt)	5,600
Princess Louise Kensington Hospital for Children (of which £500 towards building of new hospital, in accordance with the scheme submitted to the Fund)	525
Queen Charlotte's Maternity Hospital (of which £1,000 towards reconstruction and extension, in accordance with the scheme submitted to the Fund)	2,500
Queen Mary's Hospital for the East End (including Convalescent Home at Theydon Bois) (of which £1,000 towards new casualty block, in accordance with the scheme submitted to the Fund)	5,200
Queen's Hospital for Children (including Convalescent Home at Bexhill) (of which £250 to reduce debt)	4,050
Royal Dental Hospital of London	250
Royal Eye Hospital	750
Royal Free Hospital (of which £1,500 towards extension, in accordance with scheme to be submitted to the Fund)	6,500
Royal Hospital (Richmond) (of which £50 towards additional nurses' accommodation)	1,050
Royal London Ophthalmic Hospital (of which £750 towards provision of additional nurses' accommodation and wards, in accordance with the scheme submitted to the Fund)	3,250
Royal National Orthopædic Hospital (including Country Branch at Stanmore) (of which £500 to reduce debt and £1,000 towards extension of country branch, in accordance with the scheme submitted to the Fund)	4,500
Royal Northern Hospital (including Royal Chest Branch in City-road, Recovery Branch at Southgate, and Convalescent Home at Clacton) (of which £1,000 to reduce debt and £1,000 towards acquisition of adjoining site, in accordance with the scheme submitted to the Fund)	9,700
Royal Waterloo Hospital for Children and Women (of which £500 towards new nurses' accommodation, in accordance with the scheme submitted to the Fund)	3,000
Royal Westminster Ophthalmic Hospital (of which £1,000 towards removal and extension, in accordance with the scheme submitted to the Fund)	1,400
St. Andrew's Hospital, Dollis Hill (of which £300 towards new nurses' home, in accordance with the scheme submitted to the Fund)	550
St. Bartholomew's Hospital (of which £1,000 towards new operating theatres, in accordance with the scheme submitted to the Fund)	6,000
St. Columba's Hospital	400
St. George's Hospital (including Recovery and Convalescent Branch at Wimbledon) (of which £250 towards X ray improvements)	7,900
St. John's Hospital (Lewisham) (of which £100 towards reconditioning of electrical and massage department)	1,100
St. John's Hospital (Twickenham)	100
St. John's Hospital for Diseases of the Skin	325
St. Luke's Hospital for Advanced Cases (of which £100 to deficit on new buildings)	400
St. Mark's Hospital (of which £250 to deficit on extension, in accordance with the scheme submitted to the Fund)	500
St. Mary's Hospital (of which £750 towards extension, in accordance with the scheme submitted to the Fund)	6,750
St. Mary's Hospital for Women and Children (Plaistow) (of which £1,000 towards new out-patient department, in accordance with the scheme submitted to the Fund)	3,000
St. Monica's Home Hospital	125
St. Paul's Hospital	50
St. Peter's Hospital for Stone (of which £200 towards extension, in accordance with the scheme submitted to the Fund)	550
St. Saviour's Hospital for Ladies of Limited Means (Osnaburgh-street)	125
St. Thomas's Hospital (of which £1,000 towards first stages of new out-patient department, in accordance with schemes submitted to the Fund)	11,000
St. Thomas's Cornwall Babies Hostel	20
Samaritan Free Hospital for Women (including Convalescent Home at Amersham)	1,300
Santa Claus Home	50
Seamen's Hospital Society (*see* Dreadnought Hospital)	—
South-Eastern Hospital for Children (Sydenham) (of which £250 to deficit on new nurses' home, in accordance with the scheme submitted to the Fund)	1,050
South London Hospital for Women (of which £1,000 towards new out-patient department, in accordance with the scheme submitted to the Fund)	2,000
Stoke Newington Home Hospital for Women	50
Streatham Babies' Hospital (of which £100 towards removal to new building, in accordance with the scheme submitted to the Fund)	120
University College Hospital	7,500
Victoria Cottage Hospital (Barnet)	100
Victoria Hospital for Children (including Convalescent Home at Broadstairs)	2,450
Walthamstow, Wanstead, and Leyton Children's and General Hospital (of which £750 towards extension, in accordance with the scheme submitted to the Fund)	1,650
Weir Hospital, Balham	75
West End Hospital for Nervous Diseases	1,600
Western Ophthalmic Hospital	350
West London Hospital (of which £250 towards additional nurses' accommodation, in accordance with the scheme submitted to the Fund)	5,750
Westminster Hospital	5,000
Willesden General Hospital (of which £250 to reduce debt and £500 towards extension, in accordance with the scheme submitted to the Fund)	2,750

	£
Wimbledon Hospital (of which £250 towards provision of children's ward, in accordance with the scheme submitted to the Fund)	675
Winifred House Invalid Children's Convalescent Hospital Home	25
Woodford Jubilee Hospital	75
Woolwich and Plumstead Cottage Hospital	25
Woolwich and District War Memorial Hospital (of which £315 towards preliminary expenses of maintenance)	390
Total	£245,000

Lady Hall having seconded, the motion was put and carried unanimously.

Distribution to Convalescent Homes.

The Chairman of the Distribution Committee (Sir Cooper Perry) then presented the report of the Committee on the distribution to convalescent homes not attached to particular hospitals as follows, and moved the adoption of the grants.

The report stated: The President and General Council have this year fixed the sum available for distribution amongst convalescent homes not attached to any particular hospital in London at £2000, being the same amount as last year. The number of applications eligible for consideration amounted to 45, as compared with 44 last year.

Mr. Leonard Cohen (hon. secretary) presented the schedule containing the list of awards to convalescent homes not attached to particular hospitals as follows:—

	£
All Saints' Convalescent Hospital (Eastbourne)	200
All Saints' Convalescent Home (St. Leonards)	25
Baldwin Brown Convalescent Home (Herne Bay)	20
Beau Site Convalescent Home (Hastings)	25
Brentwood Convalescent Home for London Children (Brentwood)	25
Bushey and Bushey Heath Children's Convalescent Home (Bushey)	20
Catherine Marsh Convalescent Home (Worthing)	50
Children's Convalescent Home (Beaconsfield)	25
Children's Cottage Hospital (Cold Ash, Newbury) (in consideration of the fact that convalescent cases are admitted)	15
Children's Ophthalmic Convalescent Home (Mayfield)	10
Convalescent Home for Poor Children (St. Leonards)	100
Convalescent Police Seaside Home (Hove)	75
Friendly Societies' Convalescent Home (Herne Bay)	25
Home for Invalid Children (Brighton)	50
Invalid Children's Aid Association Homes—	
Brooklands Home (Worthing)	25
Clevedon Sanatorium (Broadstairs)	25
Convalescent Home for Children (Hawkenbury, Tunbridge Wells)	50
Countess Brownlow Home (nr. Berkhamsted)	25
Edgar Lee Home (Willesden)	25
Florence Emma Home (Dover)	25
Hamilton House (Seaford)	50
St. Michael's (Southbourne)	15
London and Ascot Priory Convalescent Home (Bracknell)	75
London and Brighton Female Convalescent Home (Brighton)	75
London Homœopathic Convalescent Home (Eastbourne)	25
Mental After-Care Association Homes (Fairlight)	150
Metropolitan Convalescent Institution (Bexhill, Broadstairs (Children) and Walton)	100
National Sunday School Union Convalescent Home (Clacton)	50
Pawling Home Hospital for Children (Barnet) (in consideration of the fact that convalescent cases are admitted)	10
Ranyard Mission Convalescent Home (St. Leonards)	50
St. Andrew's Convalescent Home (Folkestone)	75
St. Andrew's Convalescent Hospital (Clewer)	25
St. John's Home (Kemp Town, Brighton)	50
St. Luke's Home (Children) (Woodley, Reading) (in consideration of the fact that convalescent cases are admitted)	25
St. Mary's Convalescent Home (Birchington)	50
St. Mary's Home for Children (Broadstairs) (in consideration of the fact that convalescent cases are admitted)	75
St. Michael's Home for Men and Women (Westgate)	50
Seaside Convalescent Hospital (Seaford)	50
Suffolk Convalescent Home (Felixstowe)	50
Sunshine Convalescent Home for Children (Felpham, Bognor)	10
Surgical Home for Boys (Banstead) (in consideration of the fact that convalescent cases are admitted)	25
Tilford Convalescent Home for Children (Farnham)	50
Victoria Home for Invalid Children (Margate) (in consideration of the fact that convalescent cases are admitted)	25
Total	£2000

The motion, having been seconded by Sir Cuthbert Wallace, was then put and carried unanimously.

On the motion of Lord Mildmay, seconded by Mr. George Roberts, it was resolved that the cheques for the grants should be posted on Friday, Dec. 16th.

Wells' Legacies Distribution: List of Grants to December, 1927.

The Chairman of the Distribution Committee (Sir Cooper Perry) then presented the report of the Committee on the special distribution to hospitals in aid of extensions and improvements, out of the Wells' legacies to date, and moved the adoption of the list of grants.

This report stated: The total this year is £34,500 distributed to hospitals, besides £12,000 set aside, with the approval of the Council in May last, for grants in aid of pensions scheme for nurses and hospital officers. The amount allocated in the four years 1924 to 1927 is £224,250. The total amount of the legacies is not yet definitely known, but it is estimated that the balance as yet unallocated will amount to rather more than £20,000. The Committee hope to be in a position to submit a final list at the annual meeting of the Council in the spring. The grants during 1927 will assist in the provision of more than 180 additional beds, besides facilitating other forms of structural extensions and improvements. The total number of additional beds provided by the schemes to which Wells grants have been made during the four years is 1306. These include 144 beds reserved for accident cases.

Major H. A. Wernher (hon. secretary) presented the schedule containing the list of awards to hospitals (January to December, 1927) in aid of extensions and improvements, out of the Wells' legacies for the year as follows:—

British Hospital for Mothers and Babies, Woolwich.—£2000 towards second stage of new hospital; £1000 payable when the work is begun, and £1000 when the work is finished.

Central London Ophthalmic Hospital.—£500 to extension, increasing the number of beds from 40 to 52; payable when the work is begun, on condition that £6000 is raised by March 31st, 1927.

East Ham Hospital.—£2000 towards rebuilding as a general hospital, to be the last £2000 required to pay for the cost of the building; making, with £5000 granted in 1926, a total of £7000.

General Lying-in Hospital.—£1000 towards rebuilding of adjoining house as nurses' home and antenatal and postnatal departments; payable when the work is begun.

Harrow Hospital.—£500 towards extension, increasing the number of beds from 36 to 60, with accommodation for a resident medical officer; to be the last £500 required to render the extension free of debt.

Hospital for Epilepsy and Paralysis.—£500 towards extension, increasing the number of beds from 82 to 102; payable when the work is begun.

Invalid Children's Aid Association Heart Hospital, West Wickham.—£500 towards erection of open-air wards at new hospital, increasing the number of cots from 30 to 80.

Middlesex Hospital.—£10,000 as a third grant to reconstruction scheme; making, with £10,000 in July, 1925, and £10,000 in December, 1925, a total of £30,000.

Princess Louise Kensington Hospital for Children.—£1000 towards second stage of new hospital, increasing the number of cots from 15 to 55, payable when the work is begun.

Royal Free Hospital.—£5000 towards the scheme for the development of the hospital in celebration of its centenary; £2500 payable when the work is begun, and £2500 to be the last £2500 required to complete the first £100,000 raised by the appeal.

Royal Westminster Ophthalmic Hospital.—£2000 towards rebuilding on new site, increasing the number of beds from 42 to 85; £1000 payable at once, and £1000 to be the last £1000 required to render the new hospital free of debt.

St. Bartholomew's Hospital.—£7500 towards new surgical block, payable when the work is begun.

St. Mary's Hospital, Plaistow.—£2000 towards first stage of new out-patient department; £1000 payable when the work is begun, and £1000 to be the last £1000 to render the first stage free of debt.

Sir William H. Bennett having seconded, the motion was put and carried.

Pensions for Nurses and Hospital Officers: Present Position of the Scheme.

In the absence of Lord Donoughmore (Chairman of the Management Committee), the Vice-Chairman of the Committee (Lord Somerleyton) presented a report of the committee on the scheme of pensions for nurses and hospital officers, as follows:—

It stated that the Management Committee are informed that arrangements are being made to bring the scheme into operation on Jan. 1st under the title of "Federated Superannuation Scheme for Nurses and Hospital Officers (Contributory)." The scheme has so far been adopted by 89 hospitals in London, representing 12,176 beds out of a total of about 14,700. A large number of hospitals throughout the country are known to be awaiting particulars of the insurance companies' quotations, which are on the point of being issued by the Provisional Council. The details of the scheme in its present form differ only very slightly from those of the draft scheme as adopted by the hospitals represented at the Mansion House Conference in 1926.

His Royal Highness having briefly acknowledged a vote of thanks, the proceedings terminated.

On the same day His Royal Highness presided over the annual meeting of the League of Mercy, and read the following message from the King: "The Queen and I are gratified to know that the League of Mercy is able to render a satisfactory account of its work during the past year; and to learn that the contributions which the League has made to voluntary hospitals in London through King Edward's Hospital Fund and outside London by its own awards now exceed £500,000. In founding King Edward's Hospital Fund and the League of Mercy it was the aim and object of King Edward to maintain hospitals on the voluntary system, and we congratulate supporters of the League of Mercy on the successful results of their endeavours in this direction."

Reviews and Notices of Books.

GLYCOSURIA AND DIABETES.

Modern Methods in the Diagnosis and Treatment of Glycosuria and Diabetes. Fourth edition. By HUGH MACLEAN, M.D., D.Sc., F.R.C.P., Professor of Medicine, University of London, and Director of the Medical Clinic, St. Thomas's Hospital; Honorary Consulting Physician to the Ministry of Pensions; Consulting Chemical Pathologist to St. Thomas's Hospital. London: Constable and Co., Ltd. 1927. Pp. 212. 12*s*.

THE appearance of a fourth edition shows the demand which exists for books on the treatment of diabetes mellitus. No important changes have been made, but additional details about the value of insulin, as a result of the experience of the last four years, have been added. The dangers of insulin are described, together with the remedies which make them negligible. A word of warning is given about the treatment of patients who have symptoms of angina pectoris. The diet tables have been improved, but the reader must still be prepared to make simple calculations to ascertain how a food which contains carbohydrate may be substituted for any other food. A note on the dangers of so-called diabetic foods is timely, as harm is being done to patients who imagine that they are eating carbohydrate-free food. The observations on the results of insulin treatment show the range of improvement achieved in the condition of the patients. The statement that insulin of double strength has recently been put on the market by one firm requires amendment, for we believe that it was prepared by several firms as soon as the Medical Research Council agreed to its issue. It would seem that Prof. MacLean still uses Fehling's solution for sugar-testing, whereas other writers in this country, as well as in Canada and the United States, regard Benedict's qualitative solution as more accurate and easier for the patient to use.

The Diabetic Life. Its Control by Diet and Insulin. Third edition. By R. D. LAWRENCE, M.A., M.D., M.R.C.P. Lond., Chemical Pathologist and Lecturer in Chemical Pathology, King's College Hospital. London: J. and A. Churchill. 1927. Pp. 185. 8*s*. 6*d*.

IN a third edition of this book which has appeared within the year the author has not changed his practice in any essential degree, but there are a certain number of additions. An important chapter has been added on the new synthetic preparation synthalin, which can be taken by mouth; the results obtained were unsatisfactory. The diet tables, calculated on the 5-g. principle originally introduced by Leyton, are most valuable for the patient. Dr. Lawrence has been estimating the different amount of carbohydrate present in vegetables and fruits, and has introduced some of this work, although it is disappointing not to be able readily to identify the figures which he has altered. We would suggest the issue of pp. 114–167, which deal with diet and menus, in a separate cover for the use of wives or housekeepers who may be alarmed by the medical details which are necessary for the patient himself.

A Primer for Diabetic Patients. A Brief Outline of the Treatment of Diabetes with Diet and Insulin, including Directions and Charts for the Use of Physicians in Planning Diet Prescriptions. Third edition. By RUSSELL M. WILDER, M.D. Section on Nutrition, Division of Medicine, Mayo Clinic. London: W. B. Saunders Company. 1927. Pp. 134. 7*s*. 6*d*.

THIS primer which is mainly intended for the patient has been little altered in the third edition. It is written in simple language, and should be easily understood. The recipes for various dishes are good, but the diet tables involve more calculation than the majority of patients are able and willing to supply. Useful features of the book are the rules for the avoidance of damage to the feet and the help given in the treatment of complications, minor and major.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS.

Twentieth edition. By HOBART AMORY HARE, B.Sc., M.D., LL.D., Professor of Therapeutics in the Jefferson Medical College, Philadelphia; Physician to the Jefferson College Hospital. London: Henry Kimpton. 1927. Pp. 1094. 36*s*.

IT is an ambitious conception to combine in a single volume a text-book of pharmacology, a handbook of general nursing and an index of treatment; yet such is the purpose of this book, and the fact that it has now reached its twentieth edition testifies to the success with which the author has carried out his project. The title is an accurate description of the contents which are essentially practical, and special methods of treatment, such as massage, which cannot be carried out by the practitioner himself, are not touched upon.

The book opens with a treatise on general therapeutic considerations, which contains in addition to a concise summary of the objects and limitations of medical treatment directions for dosage and prescribing and tables of weights and measures. The next section is devoted to drugs, and the subject is approached essentially from the practical side so that, though theoretical considerations are by no means neglected, emphasis is laid on the uses of drugs, the methods of administration, and the forms in which they are put on the market. The list of drugs is thoroughly up to date, and includes a number of proprietary preparations of proven efficacy or whose value is still sub judice, in addition to official remedies.

Part III. is of particular value. In it are described those methods other than drugs that have a place in therapeutics, but which are usually left to the nurse to carry out, and too often are neglected by the student. The theory and indications for serum and vaccine therapy are well described, in addition to the uses and methods of applying such remedies as hot and cold packs, leeches, and poultices. There follows a short chapter on feeding the sick, with directions for making such articles as bran biscuits for diabetics, barley water, and peptonised milk. The remainder of the book takes the form of an index of treatment for those conditions that can be benefited by the therapeutic measures previously described. Thus abdominal emergencies are only dealt with from the point of view of expectant treatment, the indications for obtaining surgical aid being briefly outlined, and cancer, fractures, and similar purely surgical complaints are not mentioned at all. Although this section is compressed into little more than 300 pages, it is very comprehensive, and sufficiently detailed accounts are given of the various procedures to enable them to be carried out efficiently. Theorists might consider such headings as "Indigestion" and "Heart Disease" to be too vague a basis for accurate therapeutics, but adequate directions for differential diagnosis are given in the text, and the arrangement certainly makes for simplicity.

Works of this type do not claim to give full details of complex problems, such as the treatment of diabetes mellitus, and cannot replace larger and more specialised text-books. Their function is that of an encyclopædia which provides in the minimum of bulk the maximum of information on a wide range of subjects. The present volume fulfils this function admirably. It has been brought up to date, and its value as a book of reference is enhanced by two indices, one arranged according to remedies, and the other according to diseases.

MENTAL AND SCHOLASTIC TESTS.

By CYRIL BURT, M.A., D.Sc. Oxf., Psychologist, Education Officer's Department, London County Council. London: P. S. King and Son, Ltd. 1927. Pp. 432. 18s.

THE appearance of a third impression of Dr. Burt's monumental work is in itself an indication that it has met the requirements of many who had felt the need for a reliable scale of intelligence tests, standardised for the examination of children born and bred in England. The Binet scale had come from France, several revisions of it came from America, but until the first edition of this book was published there was no definitely English revision, and it had been carried out with so great care and ability that examiners, particularly of children suspected to be defective, have felt every confidence in using it.

In one respect Dr. Burt has departed from the policy of most revisers, and notably of Terman, whose Stanford revision has also found wide acceptance here, in that he has deliberately declined to add new tests to those of the Binet scales of 1908 and 1911. He admits that many tests introduced by Terman and others are valuable, but in favour of his own decision pleads in excuse the desirability of uniformity for comparative purposes. As, however, other revisers have so largely abandoned uniformity, this argument appears to lose its point, and to the examiner whose concern it is to diagnose as accurately as possible the mentality of a child, the plea of uniformity makes no appeal if it deprives him of the use of admittedly good tests, and at the same time compels him to use some admittedly worthless tests. Dr. Burt's criticism of Terman for retaining valueless tests renders him liable to an obvious retort. One has to admit, however, some point in his objection to patchwork revisions, and in his contention that what is required for real scientific work is a new scale, or series of scales, a task which would call for the coöperation of an army of workers. Dr. Burt is eminently qualified to be the generalissimo of such an army. His educational scales, which must have entailed great labour in their preliminary testing, have a much wider application than to the examination of the mentally defective. His analysis of the causes of backwardness in specific school subjects is illuminating. Of special value in diagnosis are his pictorial illustrations of the type of drawing of a man to be expected at different ages. These are based on an average of actual specimens and constitute an invaluable and unique age-scale of achievement in this direction.

The practical criterion adopted for certification of defectives for educational purposes, according to Dr. Burt, should be the amount of accommodation available in existing special schools. This comes with something of a shock to his fellow-workers, although such a criterion would doubtless be very comforting to local authorities whose provision of special schools was meagre, but who could claim that 100 per cent. of their defectives were in special schools. When the Board of Education puts upon authorities the duty of "ascertainment," its intention is that ascertainment should determine accommodation, and not that accommodation should determine ascertainment. Dr. Burt's concession to the practical here surely goes too far. His insistence on the distinction between defectives from the point of view of life and defectives who are only so for educational purposes is necessary, but too often forgotten, although to the school medical officer it is a commonplace. Dr. Burt estimates that one-third of the special school-children are of the latter type, and will grow up capable of managing their practical affairs without supervision. He merely suggests the possible impropriety of calling them defectives at all, but the necessity for their special education remains, whatever the label.

This book will remain a standard one on its subject until Dr. Burt's ideal scale is nearer fruition.

DIATHERMY.

Second edition. By ELKIN P. CUMBERBATCH, M.A., B.M. Oxf., D.M.R.E. Camb., M.R.C.P., Medical Officer in Charge, Electrical Department, St. Bartholomew's Hospital. London: William Heinemann (Medical Books), Ltd. 1927. Pp. 332. 21s.

DIATHERMY, both in its medical and surgical applications, is of increasing importance to the practitioner; he will welcome the new and revised edition of a book whose author is well known as an authority on the subject, and as one who has done much original work in connexion with it. Dr. Cumberbatch has a gift of lucid exposition of electrical matters, and it would scarcely seem possible to read the earlier section of this book without acquiring a clear understanding of the underlying electrical phenomena upon which diathermy depends. In a later section typical machines of British, German, French, American, and Dutch origin are fully described and illustrated, with an appendix in which the factors governing the choice of a diathermy generator are explained, and information as to maintenance is given. The following chapter deals with the distribution of the diathermy current in the tissues when it is passed through the body. This subject is discussed in the light of experiments made by Prof. Lloyd Hopwood, in which the current was made to traverse variously shaped solid masses of agar or gelatin dissolved in saline solution. Thermometers were thrust into the masses at suitable points to ascertain the rise of temperature, which is, of course, proportional to the current density. The section on "medical" diathermy opens with an account of the methods of application, types of electrodes used, and dosage, and sets out with great clearness the precautions which must be taken if burns are to be avoided. Details are given of the conditions in which medical diathermy is found to be of use, with notes of actual cases; of special interest is the account of the author's technique for diathermy of the urogenital tract in both sexes, with special reference to gonococcal infections. Dr. Cumberbatch's

successful pioneer work in this direction is well known. The final chapters of the book are devoted to high-frequency currents in surgery. As the author points out, there are several ways of coagulating, or even excising, malignant growths with the aid of heat generated within the tissues from the passage through them of a high-frequency current, but only one of these can strictly be called "diathermy." For this reason he prefers to use the general term "electrothermic methods of surgery."

The book is well produced and illustrated. It will be of value alike to the electrotherapeutist, the physician, and the surgeon. It can also be recommended to those studying for a diploma in radiology and electrology.

COMMON DISORDERS AND DISEASES OF CHILDHOOD.

Fifth edition. By G. F. STILL, M.D., F.R.C.P., Physician, King's College Hospital; Consulting Physician, Hospital for Sick Children, Great Ormond-street. London: Humphrey Milford. Oxford University Press. 1927. Pp. 1032. 30*s*.

THE thorough revision which this popular text-book underwent three years ago has left comparatively little room for material change in the present edition, but a number of chapters, such as those on infant feeding, nervous children, and nephritis, contain minor additions and alterations. Banana-pulp feeding is included among the therapeutic measures which the author has found useful in the treatment of marasmus. Dr. Still does not share the dislike of the use of lactose in infant feeding which has been evident in some recent publications; he regards lactose, in fact, as less laxative than any of the cane sugars. The principal addition to the book consists of three new chapters on vomiting, "pink disease," and cretinism. The first of these deals in some detail with the differential diagnosis and treatment of vomiting, stress being laid on the common occurrence of nervous factors in the ætiology of this symptom. An extremely interesting chapter on erythrœdema contains a description of its symptomatology, and a critical discussion on the exact nature of the disease. The author maintains an open mind on this question, but suggests as the most likely cause an intestinal toxæmia which produces a secondary peripheral neuritis.

This book is already a favourite both of students and practitioners, and its usefulness to them will be further increased by the additions which have been made to it.

VARICOSE VEINS.

Le traitement des varices. By Prof. J. A. SICARD and Dr. L. GAUGIER. Paris: Masson et Cie. 1927. Pp. 102. Fr.12.

THE injection treatment of varicose veins is now undergoing an extensive trial. In order that such a test should be a fair one, it is essential for the investigator to know the relevant work which has been done on the subject. In this little book he will find all the information he wants. The authors speak with the authority of pioneers, and their work has placed the sclerosing method of treatment upon a scientific and rational basis. This monograph is strongly recommended as a guide to any practitioner who proposes to adopt this method of treating varicose veins.

JOURNALS.

INDIAN JOURNAL OF MEDICAL RESEARCH. Vol. XIV., No. 2, October, 1927.—Two articles by J. A. Sinton contain further studies on malaria, with special reference to the action of "Peracrina 303," and intravenous injections of stovarsol, both of which methods proved unsatisfactory. The same writer with G. Covell, has found that the morphology of the buccal cavity of anophelines when macerated in potash constitutes a valuable aid to classification. H. D. Acton writes on porokeratoses and acquired angiomata or sarcoids; B. B. Bramachari on the prevalence of *Vibrio choleræ* in some of the endemic areas of Bengal; J. Cunningham contributes a note on the degeneration of vaccine lymph on passage through the same vaccinifer; T. A. Hughes and D. L. Shrivastava have investigated tropical cirrhosis of the liver, with special reference to the fragility of the red blood cells, carbohydrate intolerance in muscular dystrophy, and renal œdema. R. McCarrison publishes further work on the experimental prevention of stone in the bladder in rats. E. Muir writes on the effect of kala-azar in leprosy. A valuable and practical paper is the one by H. L. Shortt, Sribas Das, and Chirarji Lal on the finding of parasites in the peripheral blood of cases of kala-azar by direct microscopical examination.

Reports and Analytical Records.

VITAMIN CHOCOLATE.

(J. LYONS AND CO., LTD., CADBY HALL, KENSINGTON, W. 14.)

WE have received samples of Messrs. J. Lyons and Co., Ltd., vitamin chocolate and have submitted the claims of the manufacturers to investigation.

To test the vitamin A content, rats weighing from 40 g. to 50 g. were given a diet consisting of—

Caseinogen "vitamin-free"	15 g.
Dextrinised rice-starch	70 g.
Agar-agar..	2 g.
Salt mixture (Steenbock's)	5 g.
Dried yeast	8 g.

The dry mixture was irradiated for half an hour under a quartz mercury-vapour lamp running at 2·5 ampères 130 volts. For this it was spread out in thin layers, about 100 g. over an area of 4 sq. ft. It was stirred and re-spread after a quarter of an hour's irradiation. By this process adequate quantities of vitamin D were generated in the ration. When rats which have become steady in weight on such a diet are given a substance containing vitamin A, their growth response is deferred until, presumably, the various disorders due to the deficiency are cleared up. To test the vitamin A content of the chocolate 14 rats were used in all. A comparison was made (*a*) with a sample of best English dairy butter and (*b*) with an average sample of cod-liver oil. For the former test a litter of nine rats together with one extra rat (not strictly comparable) were used. The chocolate and butter were tested in doses of 0·05 g., 0·1 g., and 0·2 g. respectively. The curve of growth of the rats at each level of feeding indicated that the chocolate was slightly richer in vitamin A than the sample of butter used. The comparison made with the cod-liver oil indicated that the chocolate had about one-fiftieth of the vitamin A activity of the oil.

To test the vitamin D content, rats weighing from 55 to 70 g. were given a diet consisting of—

Whole yellow corn ground	76 g.
Wheat gluten	20 g.
Calcium carbonate	3 g.
Sodium chloride	1 g.

Rats on this diet develop rickets in three to four weeks provided they have not made large reserves of vitamin D in their pre-experimental feeding. One litter of rats was used for the comparison between the chocolate and the same sample of butter as used in the vitamin A test. Doses of 0·1, 0·2, and 0·4 g. of each were used daily throughout a ten days' test period subsequent to the four weeks' preparatory period, and the degree of calcification induced indicated that the chocolate was slightly richer in vitamin D than the sample of butter with which it was compared. It must be understood, however, that butter cannot be considered a *rich* source of this factor, as even the best summer butters have only about one-eightieth the vitamin D activity of an average cod-liver oil.

THE LANCET.

LONDON: SATURDAY, DECEMBER 24, 1927.

CIVIL FLYING.

THE statement that within the past two and a half years a British company, Imperial Airways, has carried over 52,000 passengers without serious accident is testimony to the fact that civilian flying is now as safe as any other form of locomotion. This must, in part at least, be attributed to the careful medical selection and periodic re-examination of civilian passenger-carrying pilots. The conditions governing these examinations were originally laid down at the Peace Convention in 1919. Since that date they have been subject to systematic revision by the Medical Subcommittee of the International Commission for Air Navigation, and at their thirteenth session held in Rome last October the first general review of the methods of medical examination and the minimal standard of requirements was completed. These standards vary somewhat for what may perhaps with convenience be called the owner-flier and the air-pilot. In respect of the latter or public licence the regulations have now been amended to include the examination of women. Save in respect of peculiarities due to her sex, it will be noted that no particular allowance has been made for a lessened physical efficiency in women, except the admission of a lessened respiratory capacity. In certain quarters there has been a disposition to look upon this as an injustice to women, because it is felt that a woman of slight build cannot be expected to attain the same degree of bodily efficiency as a full-grown man. On this account small women may possibly, it is thought, be debarred from flying. Such, however, is not the case. What is overlooked is the fact that the small woman of the white race is not being examined under standards which apply only to the men of her own race, but under such as apply to men of all the races of the world. The conditions, therefore, are such that every really healthy woman stands a reasonable chance of passing, provided she is endowed with the physical attributes which have been found in successful male pilots.

What are in fact the attributes of successful flying has been the subject of inquiry for some years, and is still being studied. The successful pilots of the past have set the standard of the present, and the successful pilots of the present will dictate the standards of fitness of the future pilots. Such a policy makes increasingly for safety in the air, since if any special bodily condition be found associated with lack of success in flying, that condition is noted and the regulations modified accordingly. We speak of "condition" rather than "defect," since fitness for piloting duties in respect of public transport and goods requires special qualities, the absence of which cannot necessarily be termed defects in terms of everyday life. For example, the aeroplane pilot must possess a very high degree of accuracy of visual judgment if he is to fly, and particularly to land, an aeroplane successfully, although he could get on quite well in ordinary life with far less accurate visual perception. He must not be liable to "air-sickness," although such a liability would hamper him but little in everyday life on the ground. He must possess the general nervous stability which will keep him cool in emergency and will, even after long hours of flying or after flights in the rarefied air of high altitudes, leave him alert and controlled. He must be endowed with such respiratory and circulatory efficiency that he can resist the effects of the cold and rare air of altitudes. Above all, he must not suffer from any disability likely to cause sudden incapacity in the handling of aircraft. Nevertheless, the medical requirements are not really very severe. When the standards of efficiency are compared with those found in the average healthy young man or woman who has never flown it is found that they are such as can be passed with relative ease by those who have taken the trouble to keep fit and to lead a healthy life, provided they are blest with keenness of perception and aptitude for performance of coördinated limb movements. On this account, those who have all-round aptitude for sports and games, rather than especial prowess in one only, and have also the power of endurance, are the most likely (although not necessarily the only) subjects to become efficient pilots. In these days of women's athletic prowess there is little likelihood of many women aerial aspirants failing to pass the medical requirements laid down for them.

Each nation is at liberty to raise the minimal requirements laid down by the International Commission, and the requirements of physical efficiency of the male British pilots represent a high standard. A definite physical index is allotted as the result of each examination, so that at subsequent examinations an estimate can be formed as to whether there has been deterioration or otherwise as a result of the number of hours flown. The keeping of this index has proved of great service as a basis for the number of hours which can be flown without medical re-examination. Until recently pilots were to be re-examined every six months or after flying 250 hours. At the recent session of the International Commission it was decided to recommend, in addition to the six-monthly overhaul, re-examination when the pilot has flown 125 hours in any 30 consecutive days. The high standard of efficiency maintained by the British pilots is a matter for congratulation. The conditions for private flying are less stringent. Broadly speaking, any average first-class life can pass this examination provided he has a visual acuity for each eye of 6/9, without or with correction, an adequate degree of hearing, and suffers otherwise from no condition capable of causing a sudden disability. A recent provision, however, enables an owner-flier who is suffering from some slight defect, which precludes him from attaining the higher standard, to obtain the public licence after having given proof of his skill on his own machine.

CORONARY RESERVE IN MICE AND MEN.

ONE of the most surprising facts disclosed by recent work on the physiology of muscular exercise is the extent of the cardiac reserve and the enormous output which the heart is able to attain during severe exertion. This can be estimated from measurements of the oxygen intake. The oxygen consumption of an average man at rest is about 250 c.cm. per minute, and since a litre of blood will carry about 200 c.cm. of oxygen, from which the tissues extract about 35 per cent. when metabolism is basal, the estimated

output of the left ventricle at rest is about 4 litres per minute. During severe physical exertion such as rowing Prof. A. V. HILL [1] has shown that the oxygen intake may actually amount to 4·4 litres per minute. Under such conditions the dilatation of the capillary field will no doubt allow of a greatly increased coefficient of utilisation of oxygen (say 70 instead of the normal 35 per cent.). On the other hand, the circulation through the lungs is so rapid that the arterial blood has not time to get fully saturated with oxygen. Assuming that the arterial saturation is 18·5 instead of 20 volumes per cent., each litre of blood might give up 130 c.cm. of oxygen to the tissues. Hence an oxygen intake of 4·4 litres per minute means a circulation-rate of 34 litres per minute, and, taking into consideration the right ventricle as well as the left, the total cardiac output reaches the enormous figure of 68 litres per minute. From the ventricular output and the mean blood pressure it is possible to calculate the work performed by the heart. Allowing a 20 per cent. efficiency, an approximate estimate may be reached of the amount of oxygen which the heart muscle itself would require to perform this work. The result of this calculation shows that, during severe exercise, the heart muscle alone requires as much oxygen as is consumed by the whole body when at rest. So even in the first-class athlete the coronary circulation probably plays a very important part in limiting the amount of physical exertion which can be undertaken. In this connexion it is interesting to compare the conditions in the coronary circulation in man with that in other mammals. The mouse is the smallest living mammal, and this may perhaps be due to its having reached the limit in the matter of coronary flow. In warm-blooded animals the smaller the animal the higher is its basal metabolic rate, and consequently the greater its oxygen requirement. The heart-rate of a mouse is about 700 per minute, and as A. J. CLARK [2] has pointed out, a further increase of heart-rate is probably limited by the impossibility of the coronary circulation supplying the necessary oxygen. In spite of the fact that the mouse's heart is very large relatively to the size of its body, even at rest it is probably working near the limit of its oxygen supply. We are therefore led to conclude that the mouse's proud position as the smallest mammal is likely to remain unchallenged, since its would-be rivals must perish from coronary insufficiency.

SAFE CHILDBIRTH.

DAME JANET CAMPBELL'S report on the Protection of Motherhood [3] which has just appeared, supplements her earlier report on maternal mortality, published in 1924. The present report reviews the existing position of the problem in England and Wales, supplies the latest available statistics, discusses the vexed question of puerperal infection, and sets out in detail the essential provisions of a complete maternity service. It is notorious that the mother's risk in childbirth has not diminished in the way that the risk of the young child has diminished during recent years. The causes of maternal mortality are, it seems, less general and less easily influenced by educational methods than are the causes of infantile mortality. They are more individual and personal, more dependent upon the necessary clinical facilities being available at one particular moment, and hence they are less susceptible to influence by the methods which have contributed to the great reduction in the infant death-rate. This country with its mortality-rate from all puerperal causes of about 4 per 1000 live births occupies a middle position in a geographical sense. Rates are low in Italy, the Netherlands, Norway, and Sweden; high in Germany, Ireland, and Switzerland; and in Australia, where many districts are sparsely populated, the high death-rate is due chiefly to deaths from causes other than sepsis, the same being true of New Zealand. It was hoped that the improved training of midwives and the provision of maternity benefit would be followed by a substantial reduction in maternal mortality in this country, but this has not proved to be the case; nor has the infant mortality-rate in the first week of life shared in the remarkable decline of the total infant death-rate. Our knowledge of the origin and spread of puerperal infection is admittedly limited and inexact. Organised extension of what has hitherto been largely the work of individual investigators on isolated cases is an obvious desideratum, and Sir GEORGE NEWMAN would like to see every maternal death made the subject of competent and thorough medical scrutiny. Dame JANET CAMPBELL would strengthen and improve the maternity service by a scheme of domiciliary midwifery in which many normal deliveries and all maternity nursing would be performed by midwives, albeit always with the active support of the patient's own doctor who would be responsible for antenatal supervision, for the conduct of normal labour if so desired, for the treatment of any complication arising in the course of pregnancy or childbirth, and for the oversight of the lying-in period together with the care of the infant. Her report is not so much addressed to a medical audience as intended to educate public opinion, in order to persuade all concerned to combine in overcoming the practical difficulties of the problem.

It so happens that a remarkable object-lesson in carrying out the principles enunciated by Dame JANET CAMPBELL is available from one of the Dominions. A maternal mortality-rate of nil is recorded by the Victorian Bush Nursing Association, Australia, for the five years 1922–27. Dr. R. MARSHALL ALLAN, who was appointed by the Edward Wilson (Argus) Trust of the University of Melbourne as director of obstetrical research for two years, to inquire into the causes of maternal mortality and morbidity in Victoria, has just issued a report on the work of the Bush Nursing Association in which he admits that, though he had always valued the service of Bush nurses, he was both surprised and gratified at the magnificent record revealed by a study of the details. The number of cases dealt with in the five years under review was 2273, of whom 749 were delivered in hospital, 685 in the patient's home, attended by both doctor and nurse, and 839 in the home, attended by a nurse only. The proportion of cases coming under medical practitioners is steadily rising, this being mainly coincident with the establishment of Bush nursing hospitals; during the five years approximately two-thirds of the cases (63 per cent.) had the advantage of medical attention. Taking Victoria as a whole, the maternal death-rate averages about 5 per 1000 births, with a rate of 3·9 in the rural area of the State. This makes the absence of any maternal death the more remarkable, especially in view of the fact that on various occasions serious complications had to be treated by doctors in private houses, in addition to hospital cases. The population is composed entirely of white people, and woman's life in the Bush, though healthy, involves great hardships. Before the establishment of the Bush Nursing Association many families were 20, 30, or even 40 miles from medical help, and a woman expecting her confinement might have to travel eight hours or more over a rough road before she could obtain advice or help. The Bush nurses work in more than 50 different centres; they are picked women who take a special course of training in obstetrics and infant welfare. Their record shows that antenatal care was given by them to no less than 77 per cent. of the patients, and that they were quick to recognise any departures from the normal, and to report them to a doctor.

[1] Muscular Movement in Man. New York: McGraw Hill Book Co. 1927. 12s. 6d.
[2] Comparative Physiology of the Heart. Cambridge, 1927.
[3] Ministry o. Health. Reports on Public Health and Medical Subjects. No. 48. H.M. Stationery Office. 1927. Pp. 87. 9d.

The whole of the factors making for safe childbirth were thus present—well-trained doctors and nurses working together as members of a team, efficient antenatal care, prompt removal to hospital of all cases showing any complication, and sufficient accommodation in well-staffed and well-equipped hospitals. The dwellers in the Bush are not only unusually fortunate in the maternity service provided for them, but unusually intelligent in availing themselves of it. Perhaps, too, there is less impatience among people accustomed to long distances and slow transport, so that the clamour for quick delivery, which Dr. ALLAN spoke of in his earlier report as a serious handicap to young obstetricians in the towns, is absent. As he says, the complete immunity from maternal deaths cannot continue indefinitely, but there is no reason why this enlightened community should not ensure permanently a mortality-rate well below what has almost come to be regarded as the inevitable minimum.

Annotations.

"Ne quid nimis."

"ASYLUM DYSENTERY."

THE high incidence of diarrhœal diseases in mental hospitals as compared with others has been attributed in varying proportion to the degenerate and dirty habits of mental patients, and to the failure of the medical and nursing staff to give them the attention which they would receive in the wards of a general hospital. Although clinical dysentery has been much reduced in recent years, many mental hospitals reporting only a few cases and some none at all, serological investigations have suggested that many more inmates harbour dysenteric bacilli than would be suspected from clinical observation alone. Since the pathologist penetrated to the wards of the asylum much work has been done on the detection of latent dysentery by means of agglutination tests. Mott and Durham [1] proved that the organism generally found in the fæces was a bacillus, though not usually one of a specific dysentery strain. According to the annual reports of the Birmingham Research Laboratories for 1925–27 no less than one-quarter of all inmates gave positive agglutinations with standard organisms, an unexpectedly large number agglutinating the food-poisoning group. Moreover, when the new admissions to the Birmingham mental hospitals were tested serologically it was found that, out of 464 admitted in 1926, no less than 23 per cent. gave positive results. The figure for all patients was 24·7 per cent. F. A. Pickworth, director of the Joint Board of Research for Mental Disease, Birmingham, has recently published a careful investigation into the agglutination of typhoid and dysentery organisms by the sera of mental patients.[2] He concludes, as a result of work on 2000 specimens of fæces and the serum of 100 patients whose fæces had shown aberrant organisms, that the bacilli of typhoid and dysenteric disease behave in a similar way to those of pneumonia; besides setting up acute disease they are frequently present as a chronic infection. The agglutination response is one out of possibly many effects of this chronic infection, but if it is taken as a constant indicator of the strength of the infection the results point to a very attractive hypothesis—namely, that a much larger proportion of the population than has hitherto been supposed is actually infected either with the specific organisms of dysenteric disease or with strains of very similar properties. "Some of these," suggests Dr. Pickworth, "may be attenuated or in symbiosis with other organisms, so that their detection by the usual methods is the exception rather than the rule, and in spite of infection and consequent marked demonstrable changes in the blood the actual disease process is so mild and transient as to be unnoticed or soon forgotten by the individual." If, as is reasonable to assume, a continuous access of these organisms to the blood stream lowers the titre by summation of negative phases, then many obscure chronic illnesses would be explained. "The immediate practical importance," he adds, "is that due values would be attached to any agglutination reaction as indicative of past infection with a possibly dangerous organism, quite apart from actual clinical disease, and these reactions should be regarded as seriously as an actual outbreak of a preventable epidemic disease." The high proportion of positive agglutination results in new admissions to mental hospitals certainly suggests some ætiological relationship between intestinal infection and mental disorder, and confirms the views expressed by Dr. William Hunter and others at the Edinburgh discussion last July.[3] At any rate it largely exonerates the institutions from the blame of negligently allowing the spread of dysenteric disease. Until, however, a widespread research has determined what proportion of the general population give agglutination reactions with these organisms, their rôle in the causation of mental disorder must remain unproven.

[1] Report on Colitis, 1901.
[2] Jour. of Path. and Bact., 1927, xxx., 627.

THE ANTIRACHITIC WAVE-LENGTH.

OUR knowledge of the wave-lengths of light concerned in the synthesis of vitamin D has been advanced a stage further by some researches of Dr. A. F. Hess and Dr. W. T. Anderson.[4] Hess and Weinstock had previously shown that the longest wave-length capable of protecting animals fed on a rachitic diet is in the neighbourhood of 3000 A.U. Following the discovery of the association of cholesterol with the antirachitic factor, the same observers were able to show that the line 3025, or possibly 3130 A.U., of the mercury arc spectrum was the longest wave-length to activate the cholesterol. The observation made by Rosenheim and Webster that ergosterol is the precursor of vitamin D led Hess and Anderson to investigate the region of the spectrum responsible for the activation of this pro-vitamin D. By the use of selective filters and improved apparatus, they have shown that cholesterol (presumably containing ergosterol) can be activated by a band of rays from 2650–2000 A.U., thus proving that rays shorter than the shortest U.-V. rays that ever penetrate our atmosphere are powerfully antirachitic. By further refinements three separate monochromatic rays were investigated, and it was found that 3130 showed slight antirachitic potency, while 3025 and 2800 A.U. of the same intensity possessed far greater antirachitic value. It appears therefore that the antirachitic rays of sunlight are restricted to the small band of rays at the extreme end of its spectrum. In view of the ease with which these rays are absorbed by smoke, dirt, and moisture, these results lend added weight to the plea for smoke reduction in crowded industrial areas where rickets is most commonly encountered.

PELLAGRA IN THE MISSISSIPPI FLOOD AREA.

PELLAGRA is always present in the region recently overflowed by the Mississippi floods—i.e., the States of Tennessee, Arkansas, Mississippi, and Louisiana. In a report [5] issued by the United States Public Health Service, J. Goldberger and E. Sydenstricker examine the conditions in which it normally occurs and the question of its increase in consequence of the floods. There is no doubt, they say, that the incidence of pellagra has very considerably increased, in the first three at any rate of the States named. Its

[3] THE LANCET, Sept. 17th, 1927, p. 606.
[4] Jour. Amer. Med. Assoc., Oct. 8th.
[5] Public Health Reports, U.S. Public Health Service, 1927, xlii., 2706.

frequent occurrence in normal years they attribute to the food habits and peculiar economic conditions which prevail in this cotton-growing area, and they show that the floods have simply operated to increase the economic pressure and to accentuate the pellagra-producing conditions. It is interesting to note that the wide occurrence of deficiency disease is almost always correlated with economic conditions when the basal diet is unsound. The basal diet of the Mississippi basin is often spoken of as the three M's ration—i.e., meat (salt pork), molasses, and meal (maize and some wheat meal), to which additions are made of dairy products, poultry, fresh vegetables, tinned meats, fish and vegetables, according to the means of the people. These means are unfortunately often small and irregular. The people are mostly small tenant farmers, growing a single crop, cotton, which brings in an income only at a certain time of the year. The cotton crop is always regarded as a speculative one, and may result in very different proceeds in different years. When, therefore, as in the last year or two, the cotton-growing industry is in a depressed condition, the people's means wherewith to buy supplementary foods are very small, and pellagra is bound to be on the increase. The bulk of the land being given up to the cotton crop, very few people have garden ground, nor is there much pasture for beasts, so that vegetables and dairy produce are scanty. This year's flood simply served to accentuate these conditions by destroying the cotton crop, drowning the beasts, and ruining such gardens as there were. Goldberger and Sydenstricker go on to make recommendations for the relief of pellagra in this emergency and for its prevention in more normal conditions. They point out that certain foodstuffs are particularly rich in the P.P. or pellagra-preventing factor. They say that when consuming only the basal diet already mentioned 40 to 50 per cent. of people will get pellagra in three to eight months, according to their previous nutritive condition. Lean meat, milk, or vegetables added to the diet will prevent this, and in particular any of the following as a daily addition: ½ lb. of lean beef, a full ½ lb. of dry cow peas, a quart of canned tomatoes, or 1 oz. of dried pure yeast. They therefore suggest that to deal with the increase of pellagra in the flood emergency local health officers should have a supply of dried killed yeast, canned tomatoes, canned salmon, or canned beef at their disposal to serve out to pellagra patients, who on adequate rations should recover in 6–12 weeks. For dealing with the chronic problem in the area they recommend diversification of agriculture to include cattle and dairy farming, the establishment of community dairies, and the cultivation of gardens, and allotments, as being the more easily modifiable of the conditions which are responsible for the wide occurrence of pellagra in this large area.

INFORMATION ABOUT THE TEETH.

SOME years ago the Dental Board decided to start a campaign against disease of the teeth, and has since spent a good deal of money in propaganda by films, lectures, and posters. In pursuance of its plan the Board has now published a small book[1] on the hygiene of the mouth and teeth, primarily intended for teachers, but also available for the general public. In preparing such a book the compilers undertake a difficult task, for it is hard to give an elementary yet faithful account of a technical subject, especially when the real intention is to prevent some disease. One must be dogmatic yet eschew controversy; on the other hand, it is unfair to give the subject a fallacious simplicity by assuming the truth of what are mere conjectures or by ignoring the evidence which seems to weaken the case presented. The anonymous authors of the Board's new book have succeeded admirably. Whilst skilfully avoiding the use of technical terms, they have not made the information too elementary, because the teachers whom it is specially hoped to reach may be regarded as an intelligent and educated class. Where a closely knit argument is necessary to tell the reader what are the factors concerned in caries, they have not hesitated to demand a certain amount of mental concentration, and this is as it should be, for knowledge is best remembered if it is not acquired too easily. The anatomical description of the mouth and teeth is excellent and is somewhat detailed, as is also desirable, and there is a good chapter on defective development, with pictures showing various forms of dental irregularity. No reader studying the photographs of individuals with what are aptly termed the rabbit, bulldog, and bird types of face can fail to realise the large part played by the teeth and jaws in shaping the features and the heavy handicap which irregularities may impose on the character and destiny of the person so afflicted. The problem of dental caries and its causation is dealt with fairly but perhaps a little too briefly; the authors seem to have skimmed over this subject warily in their laudable desire to avoid taking sides on the question whether the structure of the teeth or the diet is more important in the ætiology. Yet there are certain aspects which might have received a little more attention. It should have been made clear, for instance, that the acid which destroys the enamel is formed from carbohydrates, and that, so far as we know, the bacteria themselves cannot form lactic acid unless provided with a suitable pabulum. It is not without significance that certain carbohydrates, such as glucose, are directly fermentable into lactic acid, and that, for reasons of economy, glucose is often used in the manufacturing of cheap sweets. We should like to see more stress laid on the evil results of eating sticky carbohydrates, especially sweets, immediately before going to bed, when the muscular and glandular activities of the mouth are reduced to a minimum, so that the lodgment of food against the teeth is facilitated. Since this book is intended as a handbook for teachers who will pass on their knowledge in suitable form to those under their influence, it is very desirable that facts like these which are closely bound up with our social habits should receive full attention. Naturally the authors were anxious to keep the book small, but the addition of ten pages or so on the causes and prevention of caries would have added much to its value without increasing its length unduly. These are minor criticisms, however, and it is a high tribute to the skill with which the book is written that there is so little that calls for adverse comment.

[1] The Hygiene of the Mouth and Teeth. London: Dental Board of the United Kingdom. 1927. Pp. 85. 1s. 6d.

LEAD TETR-ETHYL.

THIS interesting compound, in which lead takes the place of the central carbon atom in tetr-ethyl methane, thus $Pb(C_2H_5)_4$, is one of many organometallic compounds which, when mixed with petroleum spirit, reduce the speed of ignition and thereby decrease the liability to "knock" in internal combustion engines. It has been used for some time in the United States; in fact, its premature introduction led to many distressing cases of lead poisoning among those working with the substance itself. A question in Parliament, answered by the Home Secretary, made public the fact that spirit containing it is now sold in this country. The mixture is coloured to a pale reddish tint, so that it may be easily distinguishable. As it only contains about 0·07 per cent. of the tetr-ethyl it does not present the same danger as the undiluted compound. It should, nevertheless, be used with caution, since lead may be absorbed from it into the system either through the skin or, more readily, through the lungs. Experiments on animals with lead tetr-ethyl have shown that there is considerable retention of lead, the excretion being appreciably less than the absorption. The tetr-ethyl compound parts with its lead very readily. A few tenths of a cubic centimetre of the commercial mixture heated with a smaller volume

of hydrochloric acid in a sealed tube in a water bath for a few minutes will, when cooled, yield obvious crystals of lead chloride from which the characteristic reactions of lead may be obtained. The hydrolysis with the water of body fluids is doubtless slower, but judging from the description of cases none the less effective. This substance will no doubt be used largely by the medical profession and by their carusing patients, and if due care is taken very little harm will result. Physicians will, however, be well advised to remember that a new and somewhat insidious form of lead poisoning may occur in subjects whose vocations are not usually associated with this risk.

LATE RESULTS OF ARTIFICIAL PNEUMOTHORAX.

TREATMENT by artificial pneumothorax has been in vogue so long that a fairly accurate estimate of its later effects can now be formed. The sceptic is not so likely to be convinced by the isolated case treated yesterday, however brilliant the result, as by series of cases running into three figures and re-examined after a lapse of several years. In a series of this kind recently described by Dr. H. Bjelke[1] 111 patients had been given the treatment at his sanatorium during the past ten years. They were classified according as their disease was of a chronic and productive or of an exudative character, and news of their ultimate fate was obtained by correspondence. Of the 41 whose disease was exudative, five belonged to the second and 36 to the third Turban-Gerhardt stage of the disease. As many as 23 were discharged from the sanatorium as improved, while four left it unchanged, and 14 in a worse condition than on admission. Very few of these 41 patients were found to have survived; only five were still alive, and several of these had but recently left the sanatorium. Thus the conclusion to be drawn from these figures is that when the disease is rapidly progressive and exudative the prospects of arresting it by artificial pneumothorax are none too good. Very different is the outlook for the patient whose infection is comparatively benign and chronic, for of 70 such patients in Dr. Bjelke's material as many as 58 were found to be still alive. During the first five years of the period under review most of the patients selected for pneumothorax suffered from the exudative form of the disease, and when a five-year survey was made of their fate, it was found that of the 48 treated up to 1922 no fewer than 29 had died, and only ten were fit for work. But among the 63 patients treated during the last five years, as many as 53 were found on inquiry to be fit for work. All but two of the 111 patients forming the whole series were sputum-positive before treatment, whereas 62 were discharged without tubercle bacilli in the sputum, or indeed any sputum at all. No case of gas embolism marred these results.

CEREBRO-SPINAL FLUID PRESSURE.

VARIOUS methods have been used to measure alterations in the pressure of the cerebro-spinal fluid before and during its withdrawal by lumbar puncture, but they all have their disadvantages, as Dr. E. S. Kilgore points out in a paper in the *Journal of the American Medical Association* for Nov. 26th. The mercury U-tube manometers and aneroids or other types of spring-gauge manometers are difficult to sterilise and of doubtful accuracy, especially at low pressures. The simple upright tube from the lumbar puncture needle, which shows the height to which the spinal fluid will rise, is fairly reliable, except when the pressure is very high. Dr. Kilgore thinks, however, that accuracy is specially important in these very cases, and to be correct the readings have to be taken before any fluid is withdrawn. An instrument designed for this purpose was described by Kausch in 1908, but it only permitted the removal, for purposes of examination, of a specimen of fluid mixed with saline, and this is a great disadvantage. In the apparatus which Dr. Kilgore has himself devised these difficulties are overcome. The lumbar puncture needle communicates laterally with one end of a miniature barrel which is divided into two halves by a rubber diaphragm, the other end of the barrel being attached to a U-tube. Before use the instrument is sterilised and filled with normal saline solution. After puncture the stilet is withdrawn, and if it has entered the subarachnoid space the pressure rises in the lumen of the needle, and the rubber diaphragm bulges towards the U-tube. The vertical limb of this tube is raised or lowered until the pressure on the two sides is equal, as shown by the return of the diaphragm to its normal position, and the height of the column of saline indicates the pressure. Cerebro-spinal fluid may then be removed by opening a stopcock on the other side of the needle, and by closing this stopcock the pressure can be measured from time to time in the same way. Dr. Kilgore says that until fluid is withdrawn the pressure may remain constant, or there may be a steady fall. In one case this fall seemed to be due to a drop in the blood pressure caused by puncture of the membranes. In a case of tabes dorsalis the pressure remained the same during the removal of 10 c.cm. of fluid. The great effect which removal of a small amount of fluid may have on the pressure was shown in the case of a patient with tuberculous meningitis. With the withdrawal of the first cubic centimetre the pressure fell from 400 to 320 mm., and it went on falling very rapidly as the next few cubic centimetres of fluid were removed. Readings taken with an instrument that could not show the pressure before the removal of fluid would in this case have given an error of 20–50 per cent. Dr. Kilgore has nothing to say of the clinical significance of pressure readings, but suggests that the types of pressure-volume curves occurring with spinal compression at various levels, or with coma of various kinds, may turn out to be useful in diagnosis.

A QUESTION OF NOMENCLATURE.

"SCIATICA is a rare and unusual disease," writes Dr. H. T. Patrick in a recent *Bulletin* of the Life Extension Institute of New York. On the other hand, Mr. Wilfred Harris says in his well-known book on Neuritis and Neuralgia, "Sciatica is a very common complaint." It is all a question of nomenclature. With the constant advance in our knowledge of the pathology of disease, the need of a standardised nomenclature becomes ever more pressing. Some years ago anatomists set an example by holding a conference to consider their own terminology, and although unanimity was not reached, there is at least an international terminology for any teacher to use if he cares to do so. Clinicians still wander at their own free will. Continental equivalents were left out of our "Nomenclature of Diseases" in its most recent edition, and the term "sciatica" appears only in the index of the Nomenclature with the remark, "*See* Diseases of Nerves." In the "International List" (of causes of death) the term appears under "Hysteria and Neuritis," subsection "Hysteria, Neuralgia." The two contradictory statements quoted above can only be reconciled by a recognition of the fact that the term sciatica is being used to designate two different conditions. Sciatica, the "common complaint," is pain in the region of distribution of the sciatic nerve, its components or branches. Sciatica, the "rare disease," is pain due to "an inflammation of the interstitial tissue of the sciatic nerve or its roots," as defined in "Modern Technique" (THE LANCET, 1926, i., 991). Even if the latter definition is accepted, it is doubtful if Dr. Patrick is correct in assuming that only ten cases out of every hundred of the "common complaint" are examples of the "rare disease," though Putti and other con-

[1] Tidsskrift for Den Norske Laegeforening, Nov. 1st.

tinental teachers incline to this view. There are several synonyms in use to describe pain arising from disease of the interstitial tissue of the sciatic nerve—e.g., neurofibrositis, interstitial neuritis, perineuritis, sciatic neuritis, essential, idiopathic, or true sciatica. Of these "sciatic neuritis" seems to be the most accurate, though "idiopathic sciatica" is being increasingly used. The fact that sciatic pain occurs in such diverse conditions makes a full examination necessary in every case, a point lately emphasised in our columns. It would surprise anyone who has not studied the matter closely to observe how often writers in medical journals are driven to begin their articles with a definition of what *they* think some particular word, phrase, or condition means, simply because there is no authoritative ruling to guide them. The need exists for a committee to define existing medical terms and to allocate new ones as occasions arise; such a committee might start by defining sciatica, eczema, cancer, and constipation.

THE ACTION OF SYNTHALIN.

ON Sept. 3rd we published a series of reports submitted to the Medical Research Council by various workers to whom synthalin had been issued for clinical trial. In doing so we pleaded for caution in view of the possible consequences of the introduction of the new remedy and drew attention to the somewhat disappointing results which had already been reported. What was said at the meeting of the Section of Therapeutics of the Royal Society of Medicine on Dec. 13th on the whole supported the belief we then expressed that the new substance has not substantiated the claims of its sponsors. Prof. H. H. Dale, relating the results of pharmacological experiments conducted in his laboratories, said that his co-workers have failed to produce any storage of glycogen in the livers of animals treated with synthalin, although they could easily demonstrate its reduction of sugar circulating in the blood. In an animal suffering from hypoglycæmia due to repeated administration of insulin, injection of adrenalin will always bring about immediate liberation of sugar from the glycogen stored in the tissues; but if the hypoglycæmia has been produced by synthalin this glycogenesis does not occur. In perfusion experiments on isolated limbs there was no deposition of glycogen in the muscles, although the blood-sugar disappeared under the action of synthalin, and Prof. Dale expressed the opinion that this fundamental difference in its action may well make synthalin a less valuable remedy than insulin in cases of diabetes. His impression was that synthalin caused a great fall in the blood-sugar only when the dose was large enough to inflict serious functional damage on the liver. Prof. Dale's experiments were admittedly made with toxic doses, because he wanted a recognisable effect; but Dr. P. J. Cammidge said that his own experiments with smaller quantities had given very similar results. Dr. George Graham, who spoke after Prof. Dale, gave interesting reports of 12 cases in which synthalin had been tried clinically with careful controls. In several of these its administration had enabled the physician to use a smaller dose of insulin, but complete replacement of the hypodermic preparation was only achieved in one case, and there were many failures and a number of toxic manifestations. Dr. R. D. Lawrence pointed out that synthalin could not be administered for long periods, and doubted whether the remedy had added anything important to the routine treatment of diabetes. Whether it is true that its employment is on the decline in Germany we are unable to say, but it seems clear that at present its use is laborious and its benefits often absent or doubtful. Prof. Dale's experiments go a long way towards explaining this disappointment, for they show that the mechanism by which synthalin reduces blood-sugar is very different from the true replacement-therapy by which insulin does its work.

Modern Technique in Treatment.

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CCLV.

PREVENTIVE TREATMENT OF DIGESTIVE TROUBLES IN YOUNG CHILDREN.

THE most satisfactory means of preventing digestive troubles in later life is to ensure the development of a robust and well-disciplined alimentary system during the period of its most active evolution—that is to say, during the first and second years of life.

Natural feeding, if properly conducted, ensures the normal development of the digestive tract during the most important period of all—namely, during the first nine months of life—and artificial feeding, if substituted for it, should aim at producing similar results by means of a milk diet modified as accurately as possible to the standard of breast milk. The moment that this milk diet, whether breast milk or artificial, is relinquished for the mixed food which is indicated at or about the time that the first teeth are cut, new difficulties and dangers immediately present themselves. Heretofore the infant has presumably had no form of carbohydrate food other than sugar (lactose, maltose, or sucrose). Now he has to learn how to convert starch into sugar for himself—a most necessary accomplishment, since starch in some form or other will in future be the main article of his diet. He has to learn how to masticate solid forms of food and to tolerate roughage or ballast from vegetable fibre, in order that he may be provided with a solid basis for his stools.

It must be remembered that during the milk age the physiological basis of the child's motions is soap—insoluble soap—consisting mainly of stearate of calcium; hence the necessity for a generous allowance of fat in the food at this period. With the substitution of a mixed diet for the milk the same amount of fat is not required, but ample provision must be made for ballast of another kind. The milk diet ensures that the child receives at least some representation of every one of the elements required for growth and maintenance. There is no guarantee whatsoever that on a mixed diet all these elements will be provided; indeed, it may be taken for granted that a large number of them will fall short of the physiological requirement. The chief offenders in this respect are mineral elements, vitamins, and cellulose or roughage.

About forty different elements or proximate principles are required to complete the physiological dietary of the child. Hence it is obvious that unless the food programme is thought out very carefully, or consists mainly of milk, many omissions or defects in balance may occur and mar its physiological rectitude. One of the chief necessities in changing from the milk to the mixed diet is to introduce every innovation very gradually.

Accompanying is a series of tables suitable for different ages between 6 and 18 months, which I have drawn up in order to assist those who would find it irksome to arrange one themselves.

These tables, with or without modifications, either by myself or others, have already been published elsewhere, but are not for the most part easily accessible.

At all periods of life included in this survey the need for accessory food factors (vitamins, mineral elements and extractives) should be kept constantly in view, and though some provision is made for them in the combination of foods suggested in the accompanying tables, it is wise to ensure the inclusion of a full complement of them from independent sources.

The younger the child the greater the need for these essential imponderabilia of diet. It is often thought unnecessary to supply infants under three months of age with orange juice or other antiscorbutic. There

DIET TABLES—6–18 MONTHS.

(6 to 7 Months.)

6 A.M.	10 A.M.	Dinner, 2 P.M.	6 P.M.	10 P.M.
Breast or M.M., 6 to 7 oz.	Breast or M.M., 6 to 7 oz. Crust, butter, a trace.	Breast or M.M., 6 to 7 oz. Broth, 2 oz., *or* red gravy, ½–1 oz., given alone or with feed.	Breast or M.M., 6 to 7 oz. Crust, butter, a trace.	Breast or M.M., 6 to 7 oz.

(8 Months.)

Breast or M.M., 7 to 8 oz.*	Breast or M.M., 7 to 8 oz.* Crust or rusk, ½ oz.; butter, ½ oz.; yolk of egg, ½ oz., in feed or lightly boiled.	Strained veg. broth, 4 oz., *or* red gravy, ½ oz.; crust or twice-baked bread, ½ oz.; butter, ½ oz.; milk, 4 oz., alone *or* given with broth.	Breast, 7 to 8 oz., and crust, ½ oz., or M.M., 7 to 8 oz. with groats or baked flour, ½ oz., *or* crumb, ½ oz.	Breast or M.M., 7 to 8 oz.*

(10 Months.)

6 A.M.	8 A.M.	12 noon.	4 P.M.	8 P.M.
Orange juice, ½ oz.; sugar, ½ oz., with water.	Milk, 5–6 oz.; sugar, ½ oz.; toast or crust, 1 oz.; butter, dripping, or bacon fat, ½ oz.	Gravy, 1 oz., *or* broth, 4 oz.; potatoes, ½ oz.; veg. marrow, cauliflower, or other veg., ½ oz. Alternative meal: Fish pudding, 2 oz.; bread, ½ oz.; milk, 5–6 oz. sugar, ½ oz.	Milk, 5–6 oz.; sugar, ½ oz.; bread or crust, 1 oz.; butter, ½ oz.; stewed apples, 1 oz., *or* jam, ½ oz.	Milk, 5–6 oz.; sugar, ½ oz.

1 Year Old.

Breakfast.	Dinner.	Tea.	Supper.
Milk, 6–8 oz.; sugar, ½ oz. Bread, toast, rusk } Singly or combined 1–1½ oz. Butter, dripping, bacon fat, &c. Singly or combined, ½ oz. Jam (without seeds, pips or skins). Jelly, treacle, honey: ½–½ oz.	Fish, 1 oz., stewed in milk (2 oz.), *or* egg, 1 oz., *or* tripe stewed in milk, ½ oz. (milk, 2 oz.); potato, 1–2 oz., mashed with ½ oz. fat. Veg.: cauliflower, veg. marrow, Jerusalem artichoke, turnip, or Brussels sprouts, 1 oz. Milk pudding, 2 oz., or custard, baked or boiled. Stewed prunes or baked apple, 1 oz.; bread, 1 oz. Water to drink.	Milk, 6–8 oz.; sugar, ½ oz. Bread, toast, rusk, plain Madeira cake,† oatmeal biscuits. } Singly or combined, 1–1½ oz. Butter, ½ oz.; jelly or jam without seeds, pips, or skins, ½–½ oz.	Bone and veg. broth, 3–4 oz. *or* milk, 6 oz.

(18 Months.)

Milk, 8 oz.; sugar, ½ oz.; cocoa, ½ oz. Bread, toast, or rusk, 1½ oz. Butter, dripping, bacon fat, ½ oz. Jam, jelly, treacle, honey, ½ oz. Watercress or lettuce in season.	Fish, steamed, 1½ oz. (and served with white sauce); Potatoes, steamed and mashed with butter (½ oz.), 1½ oz.; carrots, turnips, boiled spanish onions, or soft. veg., 1½ oz. Sponge pudding, 2 oz. or sponge cake. Stewed prunes, dates, apples, apricots, well stewed and skins removed, 1½ oz. Bread, 1 oz. Water to drink.	Milk, 8 oz.; sugar, ½ oz. Bread, toast, rusk, sponge, or Madeira cake, oatmeal biscuits. } 1–1½ oz. Butter or marg., ½ oz. Jelly, jam, or treacle, ½ oz.	None. A hot drink if necessary.

M.M. = milk mixture. * Some of the water may be omitted. † Home-made.

At *9 months* the diet is the same, except that dinner must be rather larger, and a few teaspoonfuls of stewed vegetable or baked apple pulp added.

cannot be a greater mistake, and the same applies to all other accessory food factors. It is comparatively easy to supply the latter from ordinary domestic resources, without having recourse to special preparations, but many of these are now offered in concentrated and convenient form by well-known drug-houses.

Vegetable and bone broth prepared according to my own formula from chopped bone well boiled down with vinegar for many hours in order to decalcify it, with an addition of green vegetables which are only boiled for a short time, and liver, kidney, and other internal organs, together with marmite, provide in fairly concentrated form a valuable ensemble of most of the required accessory factors; it can be given to infants and children of all ages.

Many commercial preparations such as roboleine, vitmar, vitaminose, virol, brestol, jecomalt, and radiated malt, are all good and reliable preparations of mixed vitamins. Vitamins A, C, and D are well represented in small leafed green vegetables, such as spinach and brussels sprouts. Marmite is a concentrated preparation of water-soluble D, and so are other yeast preparations, of which there are several on the market. Ostelin is a reliable and concentrated preparation containing the antirachitic factor. Mineral elements in physiological balance can be obtained by using a preparation which is now prepared, for me by Parke Davis, known as "nutritive salts."

ERIC PRITCHARD, M.D. Oxf., F.R.C.P. Lond.,
Medical Director of Infants Hospital, Vincent-square.

PRINCE ARTHUR OF CONNAUGHT ON THE TEACHING HOSPITALS.—Speaking last week at a meeting of the court of governors of Middlesex Hospital, of which he is chairman, Prince Arthur of Connaught expressed his belief that the public at large have not yet grasped the fact that the great voluntary hospitals have unostentatiously assumed responsibility for medical education and the advancement of medical science, and therefore do not appreciate the corresponding enlargement of their duty towards those institutions.

SMALL-POX HOSPITAL AT GRAVESEND.—Sir W. H. Thomas, chairman of the Port of London Sanitary Committee of the Corporation, last week opened a new building attached to, and a short distance removed from, the Port Sanitary Hospital at Gravesend. The building, which will be set aside for cases of small-pox occurring among the passengers and crews of ships arriving in the Thames, consists of two wards of four beds each with the necessary adjuncts.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the 1926 statistics of four English and two Scottish counties:—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory disease with Influenza.	Heart disease.	Diarrhœa, &c., under 2 years.	Infant mortality.	Maternal mortality from childbirth.
Kent .. .. .. (1,120,600)	16·2	11·0	0·85	1·42	1·5	1·6	6·0	55	3·6
Staffordshire .. (726,500)	19·9	10·9	0·87	1·08	2·0	1·4	8·2	72	4·4
Cambridgeshire.. (128,470)	15·2	11·8	0·86	1·75	1·5	1·7	1·0	53	3·6
Rutlandshire .. (18,020)	16·5	12·8	0·61	1·55	1·8*	1·3	3·3	63	6·6
Dunbarton† .. (54,227)	18·9	11·4	0·94	1·62	1·7	1·3	6·8	62	3·9
Dumfries† .. .. (46,108)	21·6	12·7	1·06	1·28	1·4	1·9	8·0	72	6·0

* Bronchitis and pneumonia only. † The figures refer to the county landward.

Kent.

Dr. Alfred Greenwood reports that the death-rates from both pulmonary and other forms of tuberculosis were the lowest ever recorded in the county. For the dispensary system the county is divided into eight districts and each of the eight tuberculosis officers is available for consultation at the request of the medical attendant. The county health nurses carry out health visiting and school nursing as well as the visitation of cases of tuberculosis, and it is estimated that the time devoted to the last-named work is equivalent to that of 8½ whole-time tuberculosis nurses. Institutional accommodation has been increased and there were 480 beds in use at the end of the year. The 1390 patients who received residential treatment included 69 ex-Service men, who were admitted to training colonies. The average duration of treatment for patients suffering from pulmonary tuberculosis was 158 days for males and 156 days for females. For non-pulmonary tuberculosis the duration of in-patient treatment was 330 days for males and 260 days for females. There has been great pressure on the non-pulmonary tuberculosis beds for which there is always a considerable waiting-list. Under the orthopædic scheme, which came into operation early in 1927, 48 beds are reserved for children suffering from bone and joint tuberculosis at the Alexandra Hospital, Swanley. Arrangements are made with various hospitals throughout the county and in London for X ray examinations to assist diagnosis, and 77 such were made during the year. Twenty-three patients received artificial pneumothorax treatment during the year, and Dr. F. J. Pierce (the medical superintendent of Lenham Sanatorium) reports that this treatment has proved most satisfactory, that several cases attend as out-patients, and that in the coming year their numbers will be considerably increased. Surgical appliances of various kinds are provided by the council free of charge when necessary. The 92 open-air shelters were loaned out to 129 patients during the year. The county dispensing station supplied a large amount of prescriptions, dressings, &c., to the sanatoriums and dispensaries.

The maternal mortality from childbirth was just equal to the average for the last 19 years. Efforts continue to be made to provide an efficient midwifery service, either by grants to nursing associations or by placing subsidised midwives with a guaranteed minimum income of £100 in districts where there is not a livelihood for a midwife. The practising midwives, numbering 342 (317 trained) attended between them 10,090 births and summoned medical help on 1642 occasions. A post-certificate course for midwives was held at Maidstone from Oct. 4th to 8th. Ten lectures were delivered by specialists of various kinds. The attendance was better than last year, and 194 midwives attended part or all of the course. Dr. Greenwood reports, after personal inspection of maternity homes which have applied for registration, that most of them reach a high standard of equipment. Out of 128 homes inspected 111 have been registered and 17 hospitals and homes have been exempted from registration. Round-table conferences are being arranged between the Central Midwives Board and the local supervising authorities grouped. Dr. Greenwood is acting as secretary for the S.E. group of 17 authorities for the purpose of arranging group representatives and bringing forward subjects for discussion. The first conference was held on March 3rd, 1926. The county council acts as maternity and child welfare authority for an area comprising 6 boroughs, 12 urban and 20 rural districts with a population of 404,996, and the many centres in this area are visited periodically by the assistant county medical officer, who discusses with the medical officer and health visitors of the centre matters of interest or difficulty. As regards the puerperal fever and ophthalmia neonatorum regulations a considerable number of hospitals admit these cases, and 56 nursing associations allow their nurses to attend ophthalmia cases. No arrangements have yet been made for a second opinion for puerperal pyrexia and there is no obstetric specialist practising in the administrative county. A table shows that during the last five years the infant mortality-rate in the area of the county scheme compares favourably with that in the rest of Kent. In 1926 the figures were for the special area 47·5 and for the rest of Kent 58·0.

The new houses erected in the county numbered 7256 compared with 4466 for the previous year. The shortage is given as about 8000, and Dr. Greenwood is not satisfied with the progress that is being made to overtake the shortage. He also thinks that in addition to the 235 houses reported as unfit for human habitation, there were a large number just over the borderline, and that although many property owners fulfil their obligations, there are too many "whose attitude is unhelpful from a public health standpoint and short-sighted from their own point of view."

Staffordshire.

Dr. W. D. Carruthers thinks that the vital statistics are much more favourable than might have been expected as the result of the long industrial upheaval. The death-rate from all causes was the lowest ever recorded in the county and the infant mortality-rate has only once been equalled in previous years. The county health visiting area serves a population of 321,197, including 15 urban and 14 rural districts. At the end of 1926 there were 27 combined school clinics and infant welfare centres and four infant welfare centres. In ten of the larger centres the necessary equipment has been provided for antenatal work, and the midwives have been invited to coöperate by bringing expectant mothers to the centre. It is expected that as the result of the post-certificate lectures the midwives will take full advantage of the facilities offered. In order to comply with the puerperal fever regulations arrangements have been made for the admission of cases to hospital, for home nursing if such a course is deemed desirable by the medical attendant, and for the services of a consultant obstetrician in each of the three districts into which the county health visiting area is divided, while the county laboratory is available for bacteriological examinations for the whole of the county. Only a small proportion of the cases of ophthalmia neonatorum receive hospital treatment. Thus out of 166 cases notified 12 were treated as in-patients, five as out-

patients, and the remainder at home. There were three cases of impaired vision and one of the infants died.

Under the Milk and Dairies Order, 1926, the veterinary inspections of herds will only be made when tuberculous milk is complained of by outside authorities, or when samples of milk, taken by the county council inspector, prove to be tuberculous. At a conference with the local authorities it was agreed that the county council should take samples of milk systematically throughout the county and relieve the district councils of this responsibility. Producers of dirty milk are to be referred to the County Farm Institute for help in reaching a higher standard of cleanliness. The returns made by the district medical officers of health indicate an improvement in the housing position. Until recently the new houses built have only been sufficient to deal with the natural increase of the population, but it is thought that 2000 of the 3000 houses built during 1926 will be available for reducing the number of overcrowded or unfit houses. "The existing arrears are enormous," but a very great improvement may now be expected within the next few years.

Cambridgeshire.

Dr. Frank Robinson says that the successful experience of the maternity scheme administered by the Radcliffe Infirmary, Oxford, has led to negotiations for a similar scheme for Cambridgeshire in connexion with Addenbrooke's Hospital, an essential feature of which would be the establishment of an antenatal clinic with the necessary maternity beds. The administrative county consists of the borough of Cambridge and six rural districts. The borough has its own maternity and child welfare scheme and certain duties delegated to it under the Midwives Act. There are 56 midwives practising in the whole county, 54 of whom are trained and also act as district nurses. The county council gives scholarships for the training of nurse-midwives and grants in aid of district nursing associations who employ them. During the year one new association started work. In the rural districts the nurses visit about half the expectant mothers, but there are no antenatal clinics. In the borough the facilities for the attendance of expectant mothers at the centres is little used, and it is thought that the antenatal work should be carried out by an obstetric specialist.

There are now in the county two firms holding licences for the supply of "Certified" milk. The county council is to take samples for the detection of tuberculous infection on behalf of four of the rural districts, but the other two prefer to do the sampling for themselves. When the tuberculous sample is found the machinery of the Tuberculosis Order will be used as being less cumbrous than that of the Milk Act. In spite of considerable activity on the part of the sanitary authorities in building houses, it is rarely possible to close an unfit house. There were eight notifications of encephalitis lethargica and seven deaths, making a total of 50 notifications and 26 deaths since the disease became notifiable in 1919. Dr. Andrew J. Laird, the medical officer of health of the borough, is of opinion that there is a great improvement in milk production as the result of clean milk competitions.

In the borough (population 58,820) there have been 1082 houses erected since 1920, 571 by the town council and 511 by other means. Dr. Laird reports that a supplementary housing society has been formed. It is the intention of this society to let their houses to people who cannot pay the rents of municipal houses and who are in urgent need, because of overcrowding or insanitary conditions. The society has raised funds by donations and loans at a low rate of interest, and sufficient money has been obtained to enable the first 22 houses to be begun.

Rutlandshire.

Dr. Christopher Rolleston says that only one-third of the mothers in the county have the advantage of skilled nursing in their confinements. The county council make grants to three nursing associations who employ nurse-midwives. The number of cases attended by midwives was 49, the total births being 299. Medical help was summoned in seven cases and the midwives attended 11 other confinements as maternity nurses. Dr. Rolleston refers to the advantage of periodical medical examinations in securing improved health and longer life, and points out that insured persons can have such from their panel doctors and that other persons can use the tuberculosis, V.D., and maternity centres for a similar purpose. Owing to the small figures the two deaths from childbirth make a high death-rate for the year 1926, but Dr. Rolleston shows that during the last 17 years there have been 5761 births in the county and only 14 deaths from childbirth, which gives a rate of 2·4 per 1000 births. Arrangements have been made with the Stamford Infirmary for the admission of difficult labour and puerperal fever cases. Maternity outfits are being supplied to expectant mothers below cost price and numerous applications for them are received. Dr. Rolleston suggests that arrangements should be made for a consulting obstetrician to visit Oakham and Stamford to see cases where difficulty in labour is anticipated. He would also like to see provision made for the institutional treatment of pneumonia. In 1900 11 persons died from cancer in the county and 18 from pulmonary tuberculosis; in 1926 28 persons died from cancer and only 10 from pulmonary tuberculosis. The health committee has issued a warning notice with regard to cancer of the breast for the purpose of securing early diagnosis and operation. The rheumatic children sent to the Children's Home of Rest, Liverpool, have done well. Out of 722 babies it was found that a comforter was used for 192 and not used for 530.

Three patients had pneumothorax treatment during the year. One has now left the county, but is doing well; the second is also doing well in his sixth year of treatment; and the third, who came from Leicestershire with the whole of the right lung and the larynx involved, so that she could only whisper, and with tubercle bacilli in her sputum, has now greatly improved and her sputum is free from tubercle bacilli. In referring to the Spahlinger treatment, Dr. Rolleston mentions that of eight cases treated at St. George's Hospital in 1913 and 1914 seven are dead and one untraced, and that a patient whom he saw with marked disease and tubercle bacilli in the sputum, who was at first reported to be doing well under this treatment, has just died. There is very little V.D. in the county, but it is difficult to secure continuation of treatment up to a complete cure. The percentage of mental defectives in the county is high, but Dr. Rolleston thinks this is due to extra-good ascertainment owing to the fact that he has completed 17 years in the county in the multiple capacity of medical officer for the maternity, infant welfare, tuberculosis, venereal, and school services. The county council has now adopted the Housing (Rural Workers) Act of 1926 and approved a scheme for its operation.

An outbreak of poliomyelitis took place somewhat later than the Leicestershire epidemic. There were two cases in September, 12 in October, and 3 in November. Three of the cases occurred in one household and two in another. Arrangements have been made under the Milk Act for the inspection of the milch cows in the county by three veterinary inspectors at regular intervals; 10*s.* is to be paid for each visit to the dairy and 1*s.* for each animal inspected. The biological examinations of the milk, when necessary, will be made at Cambridge.

Dunbarton.

Dr. T. L. Thomson says a beginning has been made with the inspection of farms under the Milk Act. The county is administered by an eastern and a western district committee, and the two district committees and the burghs have combined to appoint Mr. James McDougall, M.R.C.V.S., as veterinary inspector for the milk enactments and the Contagious

Diseases of Animals Acts. This appointment puts the work on a much sounder footing. The western district has 136 registered dairies containing 2959 cows. Amongst these the inspector found four tuberculous cows and he took samples from four suspicious udders, the milk from two of which was found to contain tubercle bacilli. These tuberculous cows were slaughtered under the Order. In the eastern district there are 118 dairies and 2642 cows. Among these no tuberculous animals were found by clinical examination, but samples were taken from 15 suspicious udders. These samples were submitted to microscopic examination with negative results. Apparently the biological test was not performed, in which case the time spent by the veterinary inspector in the search for tuberculous cows may have been largely wasted. In the eastern district one herd of 30 Ayrshires was tested with tuberculin and a licence granted for the sale of Grade A (T.T.) milk. It was only possible to inspect the cows in the two districts once during the year, owing to the large amount of time spent in explaining the new legislative provisions. In May a county laboratory was fitted up and in June a notice was received from the Usher Institute that examinations for local authorities would be discontinued from Oct. 1st. By the end of the year the burghs, the education authority, and the hospitals in the county had all arranged to use the new county laboratory. Ultra-violet light treatment is provided by sending the patients to Glasgow hospitals and paying their railway fares when necessary, but it is hoped to establish this treatment in the county at the new clinics which are to be built at Alexandria and Duntocher. The by-laws for seasonal workers are receiving better attention from both the farmers and potato merchants. Almost continuous inspection by the sanitary staff was necessary during the summer at the various camping-grounds, the principal one being between Ardmore and Craigendoran. Water-supply appears to be the chief difficulty. There is considerable activity in the provision of houses to compensate for slum clearances. Over 200 "slum clearance" houses are under construction in the western district and 200 more are to be erected under the 1924 Housing Act. In the eastern district about 150 "slum clearance" houses are under construction and 200 additional houses are being built at Duntocher under the 1924 Act. In the western district there were several cases of scarlet fever and diphtheria notified at dairy farms. In no case did the milk become infected, but the sale had to be suspended temporarily in some cases. During the year, owing to an outbreak of typhus fever in Dumbarton burgh, the joint hospital had to be closed to diphtheria and enteric patients, and the tuberculosis patients were sent home in order to make room for typhus contacts. In the eastern district an unusual occurrence was an outbreak of 88 cases of dysentery. The bacteriological investigation was carried out by the Glasgow public health laboratory, and it appeared to be clear that the origin of the outbreak was a farmer who had suffered from dysentery in Mesopotamia during the war, remained a "carrier," and been the means of infecting the milk. The bacilli discovered were of the dysentery type and closely resembled the Sonne bacillus, but showed serological divergences. Only one of the notified cases died and in this instance there was some doubt as to the diagnosis.

Dumfries.

Dr. John Ritchie states that the greatest degree of overcrowding exists in the parishes of Kirkconnel and Sanquhar. Kirkconnel was also the parish most affected by the coal stoppage. The infant mortality of Kirkconnel for the year was 83·3 as compared with an average of 94·7 for the previous five years. An increased amount of medical comforts was supplied to nursing and expectant mothers on account of the stoppage and took the form chiefly of milk and eggs, with a view to providing a sufficient supply of vitamins. In February an intimation was received from Edinburgh that five consumers of milk from a Dumfriesshire dairy had developed typhoid fever. Investigations showed that a woman milker at the farm had suffered from typhoid in 1904, and had a positive Widal and bacilli in her excreta. She was isolated in hospital for observation. Inquiries did not elicit any history of other cases of typhoid caused by her during the last 22 years. Much is hoped from the Housing (Rural Workers) Act, which became law in 1926, as it is impossible to close old houses owing to the shortage. A scheme for the supply of water to a considerable part of the Dumfries district was under consideration, but the cost was prohibitive. The Thornhill sewage disposal system appears to be the chief source of pollution of the Nith, and the Moffat system of the Annan. In the dairy by-laws it has been found necessary to make special provision for cow-keepers who do not sell milk, but sell butter in small quantities at certain seasons of the year. Under the Tuberculosis Order 77 cows from registered dairies were slaughtered; 57 had "advanced" disease, 15 "not advanced," and in five cases no tubercle was found. Of these 77 cows 15 were reported by the county veterinary inspectors, 36 by veterinary practitioners, and 26 by owners.

The scavenging of the small villages, where the valuation is too small to permit of a special scavenging district being formed, causes difficulties. The refuse is frequently tipped over a bank and is apt to cause a nuisance by catching fire, and in other ways. It is suggested that the refuse should be spread in layers and covered with soil after being laid down.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 10TH, 1927.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 230 (last week 366); scarlet fever, 2099; diphtheria, 1572; enteric fever, 56; pneumonia, 1424; puerperal fever, 36; puerperal pyrexia, 95; cerebro-spinal fever, 8; acute poliomyelitis, 9; acute polio-encephalitis, 3; encephalitis lethargica, 35; dysentery, 20; ophthalmia neonatorum, 95. There was no case of cholera, plague, or typhus fever notified during the week.

The cases of dysentery were notified from Amersham R.D. 1, Bristol 9, Leominster R.D. 1, Belford R.D. (Northumberland) 1, Goring R.D. (Oxford) 1, Cheadle R.D. (Stafford) 2, Reigate R.D. 1, Denbigh 4; all presumably from mental hospitals.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 76 (13) from measles, 10 (5) from scarlet fever, 23 (5) from whooping-cough, 40 (6) from diphtheria, 67 (14) from diarrhœa and enteritis under two years, and 77 (13) from influenza. The figures in parentheses are those for London itself. The deaths from enteric fever occurred one each in Willesden, Reading, and Salford. The number of stillbirths registered during the week was 263 in the great towns, including 51 in London.

Apart from the metropolis, the fatal cases of measles were notified from West Ham 1, Brighton 2, Great Yarmouth 1, Bristol 8, Stoke-on-Trent 1, Walsall 1, Derby 4, Chesterfield 1, St. Helens 2, Warrington 2, Manchester 27, Salford 4, Sheffield 5, Darlington 1, West Hartlepool 1, Newcastle-on-Tyne 1, Rhondda 1. In the same week 34 fatal cases were notified from Glasgow and 6 from Dublin.

DONATIONS AND BEQUESTS.—Mr. William Thelwall Thomas, F.R.C.S., of Allerton, Liverpool, left, among other bequests, £5000 to University of Liverpool to endow a Fellowship in surgical pathology; £5000 to the Royal College of Surgeons, Lincoln's Inn-fields, W.C.; £5000 to the Royal Medical Benevolent Fund, for pensions for medical men and their widows; £1000 to the Liverpool Medical Institution for the annual purchase of books of reference or journals; his house, 84, Rodney-street, in trust to be used as chambers for medical men so long as the executors shall think fit; and the portrait in oils of himself to Liverpool University.

Special Articles.

MEDICAL REQUIREMENTS FOR FLYING AS LAID DOWN BY THE INTERNATIONAL COMMISSION FOR AIR NAVIGATION.

PRIVATE PILOTS (OWNER-FLIERS).

1. *Licence.*—Every candidate before obtaining a private pilot's licence (flying machine) will present himself for an examination by qualified medical men specially designated for that purpose by the contracting State issuing the licence.

2. This medical examination shall be based upon the following requirements of mental and physical fitness :—

History.—Good family and personal history, with particular reference to nervous stability, as to which information shall be given in a statement made and signed by the candidate and satisfactory to the examining officer.

Age.—Candidates for private licences (flying machines) may not apply for a licence before the age of 17.

General Surgical Examination.—The candidate must neither suffer from any wound or injury, nor have undergone any operation, nor possess any abnormality, congenital or acquired, which might interfere with the safe handling of aircraft under ordinary conditions.

Palpation of the abdomen and abdominal viscera, particularly the pyloric, vesicular, duodenal, and appendicular regions, whenever it reveals any swelling or distinct pain, must be completed by a radioscopic and radiographic examination.

Any surgical intervention in the biliary passages or the digestive tube, except appendicitis, involving a total or partial excision or a diversion of one of these organs, any anatomical lesion in the walls of any part whatever of the digestive tube, any stricture of its calibre, any calculus or foreign body, any peritoneal lesion, established by clinical or laboratory examinations, will entail rejection. Exception may be made for spasmodic strictures not accompanied by other troubles and for ptoses compensated by a good abdominal musculature.

Diseases of the liver (including those of the biliary passages) and of the pancreas will in cases where it is deemed necessary be verified by laboratory examination, particularly by radiography as well as by an examination of the blood and of the urine, and will entail rejection only if they afford indication of the existence of a calculus, tumour, or lesion involving a persistent impairment of function of these organs.

General Medical Examination.—The candidate must not suffer from any disease or disability which renders him liable suddenly to become incompetent in the management of aircraft. He must possess heart, lungs, and nervous system in a state to withstand the effects of altitude. He must be free from kidney disease, and must not present any clinical sign of syphilis, nor have any cardiac lesion.

Eye Examination.—The candidate must possess a degree of visual acuity equal to 6/9 for both eyes with correction by glasses if necessary, the visual acuity being measured by means of a powerful illumination not shining directly into the eyes of the examinee. Ocular poise, the field of vision of each eye, and colour perception must be normal.

Ear Examination.—The middle ear must be healthy. The candidate must possess an auditory acuity not less than that corresponding with the perception of the whispered voice at 1 metre. The vestibular mechanism must be intact and not hypersensitive. It must be equal on both sides.

Nose, Throat, and Mouth Examination.—The candidate must possess free tubal air entry on both sides.

3. Each contracting State shall provisionally fix its own methods of examination, until the details and the minimal conditions of the tests shall have been settled by a decision of the International Commission for Air Navigation. . . .

4. The successful candidate will receive a medical certificate of acceptance, which must be produced before the licence can be issued. . . .

5. Any aircraft pilot certificated before June 28th, 1925, will be considered as having fulfilled the requirements mentioned above for the granting of a certificate of physical fitness unless he should be found to have a pathological defect capable of causing a sudden accident.

OPERATING CREW OF AIRCRAFT ENGAGED IN PUBLIC TRANSPORT OR AERIAL WORK.

6. *Licence.*—Every candidate before obtaining a licence as a pilot, navigator, engineer, or member of the operating crew of aircraft engaged in public transport or aerial work will present himself for examination by medical men specially designated by the contracting State issuing the licence.

7. *Preliminary Examination.*—The candidate, before undergoing the examination referred to in the preceding paragraph, must have successfully undergone a preliminary medical examination at which he must have satisfied the minimal requirements as to physical fitness indicated below. This examination will be made, at the option of the State issuing the licence, either by the medical men referred to in the above paragraph, or by any other medical man.

The candidate must have the complete use of his four limbs, must not be completely deprived of the use of either eye, must be free from any active or latent, acute or chronic, medical or surgical disability or infection. He must be free from any injury or wound which would entail any degree of functional incapacity which might interfere with the safe handling of aircraft at any altitude even in the case of prolonged or difficult flight. He must be completely free from hernia, must not suffer from any detectable sensory lesion, and must be free from a history of morbid mental or nervous trouble.

8. Medical supervision, both for the selection and the maintenance of efficiency of the personnel specified in paragraph 6, shall be based upon the following requirements of mental and physical fitness :—

History.—The candidate will be questioned at the first examination concerning his family and personal history.

Examination of the Nervous System.—At the first examination the examination of the nervous system of the candidate shall comprise a full inquiry into family and personal history. The information obtained shall be given in a statement made and signed by the candidate and accompanied, if possible, by a certificate in regard especially to losses of consciousness, fits, and convulsions of all kinds, from the candidate's ordinary medical adviser or a responsible person who has known him for a long time. This statement and this certificate must be deemed satisfactory by the examining medical officer.

The candidate must not present any mental or trophic impairment, pathological tremor, or presumptive evidence of latent epilepsy. Motility, sensibility, tendinous, cutaneous and pupillary reflexes, coördination of movements, and cerebellar functions must be normal. An exception may be made for local peripheral trouble due to accidental section of a nerve branch.

Fractures of the cranium involving the internal table of the cranial box, even without apparent impairment, will entail temporary unfitness during a period of two years from the date of the fracture.

Any presumed nervous syphilis will entail rejection, unless the non-existence of such an impairment is proved by an examination of the blood and an examination of the cerebro-spinal fluid, made with the consent of the candidate.

Age.—Pilots and navigators of aircraft engaged in public transport may not enter upon their duties before 19 or after 45 years of age.

General Surgical Examination.—The candidate must neither suffer from any wound or injury, nor have undergone any operation, nor possess any abnormality, congenital or acquired, which might interfere with the safe handling of aircraft at any altitude even in the case of prolonged or difficult flight.

The rest of this examination is the same as for private pilots.

General Medical Examination.—The candidate must not suffer from any disease or disability which renders him liable suddenly to become incompetent in the management of aircraft. His muscular power must be adequate for the handling of the types of aircraft he will have to pilot or the apparatus he is to use.

He must not have any signs of aneurysm of the large arterial trunks, nor have any cardiac lesion, even if well compensated; the heart must be normal, with normal function; and only respiratory arrhythmia, increase of pulse-rate from excitement or exercise, and a general slow pulse not associated with auriculo-ventricular dissociation will be allowed.

The candidate must not suffer from any acute disability of the lungs, nor possess any cicatricial lesion of the lungs, and must be free from tuberculosis capable of being diagnosed by the usual clinical methods, from tracheo-bronchial

disease of the glands and from pulmonary emphysema, even if slight. However, with regard to the maintenance of efficiency of the personnel specified in paragraph 6, pulmonary emphysema will entail rejection only when the pulmonary capacity falls below 3½ litres at rest after a full exhalation and inhalation, and when the duration of the breath-holding falls at rest below 50 seconds, or only 40 seconds if the candidate is less than 1 metre 65 cm. in height or is of the female sex. In addition, each examination shall include a radioscopy record in doubtful clinical cases.

The candidate must not present any signs of organic disease of the kidneys; these latter must be insensitive to palpation and of normal size. Renal ptosis will entail rejection; this rule, however, will not apply as regards the maintenance of efficiency if no functional trouble is involved. The urine must not contain any pathological element. Affections of the urinary passages and of the genital organs, even blennorrhœa, may entaif temporary or definite unfitness, an exception being allowable as regards the maintenance of efficiency in the case of tuberculous orchi-epididymitis in its mild and localised form.

Women Applicants.—Candidates of the female sex must present a normal uterus and appendages. Cases in which surgical intervention has taken place will be considered individually. Any presumed pregnancy will entail rejection. Following confinement or miscarriage, the holder of a licence will be allowed to resume her air duties only after having undergone a new medical examination.

The candidate must not present any clinical signs of syphilis.

Eye Examination.—The candidate must possess a degree of visual acuity compatible with the efficient performance of his duties. Pilots and navigators must possess visual acuity equal to 100 per cent. for each eye taken separately and without correction by glasses, the visual acuity being measured by means of a powerful illumination not shining directly into the eyes of the examinee. Binocular vision, ocular poise, the field of vision of each eye, and colour perception must be normal.

Ear Examination.—The middle ear must be healthy. The candidate must possess an auditory acuity not less than that corresponding with the normal perception of the tuning-forks C (1) 64 vibrations per second, C (3) 256 vibrations per second, and C (7) 4096 vibrations per second, the forks being held perpendicularly to the ground 1 cm. from the auditory tube. The vestibular mechanism must be intact and not hypersensitive; it must be equal on both sides.

Nose, Throat, and Mouth Examination.—The candidate must possess free nasal and tubal air entry on both sides and must not suffer from serious, acute, or chronic affections of the buccal cavity or upper respiratory tract.

9. *Provisional Methods.*—Each contracting State shall provisionally fix its own methods of examination, until the details and the minimal conditions of the tests shall have been settled by a decision of the International Commission for Air Navigation. . . .

10. *Certificate of Acceptance.*—The successful candidate will receive a medical certificate of acceptance, which must be produced before the licence can be issued or renewed.

11. *Re-examination.*—In order to ensure the maintenance of efficiency, every member of the personnel specified in paragraph 6, who holds a licence, shall be re-examined periodically at least every six months, if of the male sex, and every three months, if of the female sex, by medical men specially designated by the contracting State issuing the licence, and the findings shall be attached to his original record. In case of illness or accident also he shall be re-examined and pronounced fit before resuming air duties. The date and result of such re-examination shall be recorded on the licence of the person examined.

12. *Carrying On.*—Any member of the operating crew referred to in paragraph 6, who is able to produce proof that since his last medical examination he has not ceased to perform his duties in a satisfactory manner, and that he has accomplished a total of at least 200 hours of flight within the two years last preceding, may be retained in service so long as his physical capacities as ascertained at his last medical examination are sufficiently maintained, unless there be detected in him a pathological defect capable of causing a sudden disability.

A candidate already holding a licence issued after a medical examination but not valid for public transport or aerial work, may be accepted, subject to the conditions specified in the preceding sub-paragraph, as a member of the operating crew referred to in paragraph 6, provided that he can produce proof that, since his last medical examination, he has not ceased to carry out in a satisfactory manner the function in respect of which he applies for one of the licences enumerated in paragraph 6, and that he has accomplished a total of at least 200 hours of flight within the two years last preceding.

LIGHT AND HEAT IN MEDICINE.

AN INTERNATIONAL EXHIBITION.

Lieut.-Colonel F. E. Fremantle, M.P., opened the First International Exhibition of Light and Heat in Medicine, Surgery, and Hygiene which was held at the Central Hall, Westminster, from Dec. 13th to 16th.

Dr. King Brown, medical officer of health for Battersea, who presided, emphasised the need for caution in sunlight treatment, and the necessity for medical supervision in all cases, because so little was known of the actual mode of action of the rays.

The exhibition itself was attractively laid out, and there was a wide range of apparatus on view. Probably the commonest type of U.V. (ultra-violet) producer is the quartz mercury-vapour burner, and several improvements in this have recently been made. The Hewittic Electric Co. showed a burner made of vitreosil which cuts off wave-lengths below 2500–2800 A.U., and in combination with two metal filament lamps gives a spectrum closely resembling that of the sun at high altitudes. A similar result may be obtained by placing a vitreosil screen in front of a quartz burner, and examples of this method were also exhibited. The same company also showed an A.C. burner which can be lit, without tilting, by passing a high-tension discharge through the burner by way of a special electrode. No doubt this eliminates the risk of damage by too vigorous tilting, and is convenient where a lamp is relatively inaccessible. Another improvement is a burner which permits the reversal of polarity without sustaining damage. This is shown by British Hanovia Quartz Lamp Co., but is only obtainable in a small size.

The design of stands has reached a high level. The majority shown are very stable, and allow every necessary movement. Some, however, are not so satisfactory, though none was noticed which could be considered dangerous. Several overhead types were shown, and these may perhaps be viewed with a certain amount of doubt as fracture of burners, with consequent spilling of hot mercury, is not impossible though it rarely happens. We would like to see more polarity indicators on lamps, as the majority of burners in use would be damaged by a reversal of polarity even for a very short time.

A.C. burners were numerous; a new type, the open limb burner, of Gallois et Cie, and by Kelvin Bottomley and Baird is an improvement, as it minimises the shielding of limbs by each other. Open arc lamps were also well represented, many forms being available, and there was also a large variety of carbons giving different types of spectrum. Most of the lamps exposed for sale as suitable for home treatment are of the carbon arc type, some using impregnated or coved carbons, and others apparently plain carbons. Lamps burning metallic electrodes are to be seen, and of late have shown considerable improvements, especially in the striking gear and carbon holders. Care is needed in manipulating these lamps, both from the electrical and therapeutic points of view. When replacing electrodes it is easy to get an unpleasant shock unless the main switch is open, whilst from the therapeutic side it is easy to get a severe reaction from comparatively short exposures. The metals employed are usually tungsten, iron, copper, and aluminium, and the radiation contains a considerable proportion of the short wave-lengths which are so active in causing erythema. In connexion with this kind of lamp it is interesting to note that Bellingham and Stanley have introduced a new alloy, the "B.S. Alloy"; this is intended to replace

tungsten, as it costs only one-quarter as much as that metal, and burns even more slowly. The spectrum somewhat resembles that of tungsten, except that it is specially rich in radiations in the region 2900–3100 A.U.

Portable forms of U.V. lamps and those designed for home use were shown on many stands. They are nearly all designed to be run from ordinary house circuits where the fuses are seldom intended for more than 5 ampères. This is the average figure for the carbon types on starting, and it drops a little once the arc comes into action. Various devices are used to obviate any chance of overdose. The Ulviarc by the B.I. Syndicate uses a time clock which can be set up to 15 minutes; unless it is set the lamp cannot be switched on and after the lapse of the time indicated the lamp is switched off and cannot be relighted till the clock is set again. This clock and switch may be had separately in a neat case for connecting with any lamp not using more than 5 ampères. The action is the same as when it is incorporated with this firm's portable lamp. The Quain lamp prevents overdosage by arranging that the carbons only burn for ten minutes, after which they have to be readjusted by hand. These are very important features in any lamp for home treatment, and further points to be looked for are the possibility of getting shocks by touching bare metal or carbons connected to the mains. The majority of the portable lamps now appear to have adequate insulation and control switches. The tendency is to arrange controls permitting use of the lamp on all normal main voltages. The carbon type of arc seems to be the most suitable for use in patients' homes because if appropriate carbons and powers are employed it is relatively weak in the shorter wave-lengths, which appear to be the most dangerous when used in unskilled hands. The enclosed quartz mercury-vapour lamp can now be had in portable form, but in view of the above considerations it does not seem to be suitable for use by patients themselves—if this is ever advisable. Two such outfits were noticed. The first, shown by the British Hanovia Quartz Lamp Co., and called the "Homesun," consists of a small quartz burner in a metal hood mounted upon its resistance unit; the burner is for direct current only, and can be connected to the main in either direction without damaging the burner. This lamp consumes 250 watts from the main. Kelvin Bottomley and Baird showed a neat outfit contained in a box about the size of a large suitcase consisting of a quartz mercury burner suitable for either direct or alternating current, with resistances for all voltages and parts for a stand enabling a patient to be treated in any position. This outfit is intended for medical practitioners who wish to treat patients in their own homes or in nursing-homes. It is designed to run off ordinary circuits.

Apart from their therapeutic value ultra-violet rays have many applications in the sciences. Thus the Westfield College (University of London) showed an interesting series of experiments with U.V. rays on plants. It appears that the effect of unscreened U.V. rays is a definite retardation of growth, but when screens of various glasses are used hardly any difference between controls and experimentals is noted. This suggests that the plant, whose metabolism depends entirely on the sun, is unable to make use of—and is even damaged by—wave-lengths shorter than those the sun itself emits. U.V. rays are also being used very widely in optics. Kelvin Bottomley and Baird showed U.V. lamp for ophthalmoscopic work and microscope illumination, and a type with a filter cutting off all visible light which would be suitable for a skin clinic, especially for ringworm cases. R. and J. Beck showed microscopes, spectroscopes, and spectrometers, and Carl Zeiss exhibited a variety of microscopes and illuminants for ordinary polarised and monochromatic light. They also had an electric ophthalmoscope on view. U.V. water-sterilisers were shown by Kelvin Bottomley and Baird and the Hewittic Co. The latter company's steriliser consumes 3 ampères and delivers sterile water at a rate of 140 gallons per hour. The taste of the water is unaffected, and we are informed the method is used by a large aerated water firm. The sterilisers can be obtained in very large sizes suitable for even the largest quantities of water.

High-frequency and diathermy machines were on exhibition, but there appear to be few changes, except for the introduction by Kelvin Bottomley and Baird, in conjunction with Gallois et Cie, of evacuated quartz electrodes for high-frequency machines. These electrodes contain a little mercury and therefore, it is claimed, emit ultra-violet radiation. A spectrograph is given showing a typical mercury spectrum said to have been obtained from one of these electrodes. Quantitative details are not given, but the emission must be very small unless the electrode is a more efficient generator than the mercury-vapour burner.

The Chloride Electrical Storage Co. exhibited a very wide range of storage batteries. They are a decided improvement upon the dry cell for galvanic treatment, and for radium balances and electroscopes they are invaluable. Portable unspillable types are available for surgical lamps, cauteries, &c. For scientific institutions they are useful for providing a steady source of energy.

MEDICINE AND THE LAW.

Insanity as a Reason for Divorce.

THE legal situation regarding divorce for insanity varies greatly in different countries, as was brought out recently in a report made by Dr. Boven at a congress at Blois.[1] In France insanity is no longer considered a reason for divorce. A law passed in 1792 admitted insanity as a cause for divorce, but this was annulled by the Code Napoléon and divorce cannot now be obtained for this cause. The law in the United States varies according to State legislation. In some States insanity is considered a sufficient cause for divorce after six years (Idaho) or after ten years (Washington) of confinement. In other States the marriage may be annulled on grounds of epileptic or alcoholic mental disorders. In Sweden divorce may be pronounced if one of the parties is suffering from a mental disease which has lasted for three years of married life and if there is no hope of permanent cure. Since 1910 Germany has allowed divorce for insanity if it has lasted for three years, is sufficiently serious to destroy mental relations between the couple, and is considered incurable. A Swiss law passed in 1912 allows divorce if cohabitation is no longer possible, if the disease has lasted three years, and has been pronounced incurable by experts. In practice, divorces for insanity are fairly rare; out of 21,025 divorces granted in 11 years, only 435 (2 per cent.) were for mental causes. Dr. Boven weighed up the pros and cons of divorce for insanity. Among the former he placed the interests of the healthy husband or wife, and the fact that, in those countries where divorce is not allowed, efforts are often made to frustrate the law by bringing forward other motives for divorce. Against divorce, he argued that mental diseases are not essentially different from others, that it is almost impossible to say when a case is incurable, as cures are often effected after long years of confinement, and that doctors might become liable for damages for having broken up the home. On the whole, however, he was favourable to divorce on the grounds of insanity, but with certain restrictions.

Burning of Body to Avoid Inquest.

At the Lewes Assizes on Dec. 10th a woman pleaded "Guilty" to the charge of destroying the dead body of a five-months' old nurse-child at Brighton with intent to prevent an inquest being held. The prosecution alleged that she had burnt the body and scattered the ashes along the roadside. She had not registered the child. A superintendent of police stated that inquests had been held at Portsmouth

[1] See Paris Médicale, 1927, xvii., 287.

in 1913 on two nurse-children who were in the care of the accused and that in one of these two cases the coroner had spoken strongly of her conduct. Mr. Justice Horridge, describing her as a very wicked woman, passed sentence of nine months' hard labour.

It may be of interest to recall that the charge in the Lewes case was identical with that in R. *v.* Price which occasioned the elaborate exposition of our burial law by Mr. Justice Stephen at the Cardiff Assizes in 1883. At that date there was a general idea that to dispose of a body by burning—a practice opposed to the common sentiment of the country—was illegal. Price had put a dead child's body in a 10-gallon cask of petroleum and had set the cask on fire in a field. A crowd collected, earth was thrown on the body, the flames were extinguished, and Price was charged, first, with having prevented the holding of an inquest, and, secondly, with having attempted to burn the body. There was evidence that the coroner had told him that, unless a medical certificate was forthcoming, an inquest would be held. Price was acquitted on both charges, but Stephen's address to the grand jury remains an important authority on the coroner's right to hold an inquest, the limitations on his power to interfere with funeral arrangements, the offence of obstructing an inquest, and, lastly, the lawfulness of cremation. Stephen announced that he could find no authority for the proposition that it was a misdemeanour to burn a body; in the absence of such authority he declined to declare it a crime. He held cremation to be lawful provided that it was so conducted as not to amount to a public nuisance at common law, and provided also, of course, that the body was not burnt in an attempt to defeat the course of justice. "It may be that it would be well," he said, "for Parliament to regulate or to forbid the burning of bodies, but the great leading rule of criminal law is that nothing is a crime unless it is plainly forbidden by law." He reaffirmed his opinion in R. *v.* Stephenson in the Court of Crown Cases Reserved in the following year. The result was a movement to establish crematoria, the law having been ascertained to be no longer hostile, though Parliament did not deal with the subject until the Cremation Act of 1902.

"*Rum and Butter Toffee.*"

The Sale of Food and Drugs Acts continue to set nice problems to magistrates. The Bishops Auckland bench had to deal with an inspector's information under these Acts arising out of the purchase of something described as "Riley's Rum and Butter Toffee." A confectioner was charged with selling to the prejudice of the purchaser an article not of the nature, substance, and quality demanded. The manufacturers, who had supplied it under a warranty, accepted responsibility and were proceeded against for giving a false warranty. Analysis showed the toffee to contain both rum and butter; it had the flavour of both, but it also contained a large percentage of coconut fat which had been added to prevent the toffee from being too sticky. The case stated by the magistrates, who convicted the manufacturers and imposed a fine of 40*s*., set forth that toffee made with no fat but butter would be greasy both to touch and taste, that coconut fat was nutritious and harmless, and that toffee made partly of coconut fat had for years been sold as "rum and butter toffee." It was also stated that the flavour of rum and butter could be produced synthetically and that, if such flavouring were used, the substance which resulted would be properly called "rum and butter-flavoured toffee," not "rum and butter toffee." The King's Bench Division, by a majority of two judges to one, upheld the magistrates' conviction. Branson and Avory, J. J., said toffee was something which could be made with various fats, and the description "butter toffee" must mean toffee in which the only fat used was butter. Talbot, J., dissenting, said he thought "rum and butter toffee" meant toffee with a substantial amount of rum and butter in it; in his view the manufacturers should have been acquitted. There seems a good deal to be said for the latter opinion.

Correspondence.

"Audi alteram partem."

THE PRESENT POSITION OF THE VOLUNTARY HOSPITAL.

To the Editor of THE LANCET.

SIR,—Having just completed a ten months' tour in Australasia, Canada, the United States, and Great Britain investigating problems of medical education, research, and administration, in which the present and future of the voluntary hospital have naturally formed an integral part, I have read Dr. Graham Little's address with considerable interest. The more so, because my recent experiences amongst some of the finest of the self-supporting hospitals have led me seriously to doubt the alleged superiority of purely traditional methods, and Dr. Little's address has done much to resolve those doubts. His thesis appears to be that the voluntary system must be maintained intact by all means in our power, because "it is to be borne in mind that the alternative to the voluntary system is exactly this bureaucratic control which would necessarily be many more times expensive." I venture to believe that Dr. Little's address itself furnishes some destructive evidence against his thesis, whilst his reason appears to be demonstrably wrong.

Between the years 1913 and 1925 Dr. Little states that the cost per bed has increased by 100 per cent., and of this present-day cost of £200 per bed, some £93 has to be found by charitable appeal. This appeal has to be made to the most heavily taxed people in the world, already straining under burdens of contributions to upwardly rising poor rates, unemployment doles, insurance schemes, and the like, and yet this steadily increasing medical and national pauperisation of the people is to be maintained intact by every means in our power.

Dr. Little states that the middle class remains outside this system altogether, but that it is high time that some provision was made for their proper medical treatment. It is difficult to understand how the voluntary system of charitable doles to voluntary hospitals, largely and increasingly unable to meet the present requirements of either patient or advancing medical science, is to cope with this new burden. But is it not a fact that post-war financial stringency is forcing this very middle class into voluntary hospitals intended originally, at all events, for the indigent sick?

Dr. Little's article would appear to prove that this is so, for he quotes with apparent approval that there are now 1600 more hospital beds in London than there were before the war, and this fact is adduced as evidence of progress and very vigorous life. To me it appears as the exact contrary. It looks as though there were a rising tide of medical pauperisation, of a constant seeking of something for nothing, of a national decay of morale, and of an ever-increasing tendency to put one's own burdens on to someone else. Patients who now seek hospital aid are clearly seeking the charity of others, and are doing so apparently in constantly increasing numbers. The position is fraught with possibilities of disaster, and the maintenance of the voluntary system, with its false economics, its inability to meet the constantly rising costs of medical science, and the obvious impossibility of such a system coping with the demands of advancing knowledge in the progress of medicine must inevitably bring the day of disaster appreciably nearer.

Dr. Little's paragraph on "paying beds" is also, I think, condemnatory of the system he seeks to defend, for it simply perpetuates the vicious circle. Willing to pay board and lodging, but unable to pay for medical advice, such patients are to swell the already swollen and inadequate hospital accommodation and are to be a further charge on medical, if not public, charity. To relieve the financial impecuniosity of the voluntary hospital at the further expense of the

medical profession is a curious reason for maintaining such a system intact. At the least, the Chancellor of the Exchequer should be invited by Dr. Little to remit all medical income-tax.

If the present voluntary hospital system is in quite the parlous condition set forth by Dr. Little I am unable to visualise its coping successfully with future progress in medical science, nor do I see the voluntary hospital adapting itself to such progress. It is a financial impossibility. Nor can it be supported by the manifest fables which someone has been telling Dr. Little of American hospital medical service. I visited many of the leading Canadian, Eastern, and Middle-West American hospitals in the early part of this year, and nowhere did I see the truly humorous state of affairs described by him. On the contrary I saw large, efficient, well-endowed, and *self-supporting* medical centres, combining hospital and medical school, and having seen such self-supporting hospitals I am quite unable to accept Dr. Little's contention that the voluntary system is the *only* alternative to his, and my, detestable bureaucratic control. It is because I so cordially agree that "State-aided institutions are the product of a weak-kneed generation" that I would earnestly beg him, and those who think with him, to investigate, as has been my own good fortune, other systems, before nailing the flag to the mast of a decadent and dangerous voluntary system, under the mistaken belief that bureaucracy—the present-day menace of democracy—is the only alternative.

In conclusion I should like to assure Dr. Little that these remarks are not made in that, to me, most detestable of all forms of criticism, the purely destructive. On the contrary, experience has led me to believe that upon the wise solution of an acute and difficult problem depends, not only the welfare of those magnificent institutions which he has so much at heart, but also that of the nation itself, and if this be so, then no stone should be left unturned to secure that future success to which the past and present splendid effort of British medicine so justly entitles it.

I am, Sir, yours faithfully,

RICHARD J. A. BERRY.

Dean of the Faculty of Medicine, University of Melbourne.

Dec. 17th, 1927.

To the Editor of THE LANCET.

SIR,—Dr. Graham Little's address touches upon a wide range of important subjects. In regard to medical education, perhaps the most significant change that has ever taken place is the subsidy granted by the Treasury through the Board of Education. For this subsidy has averted a bankruptcy in a system whose success depended, up to 1858, the date of the Medical Act, solely upon the fees of the pupils, and indirectly upon fees paid for examinations. Since, the old universities, owing to their endowments and the new, mainly from Governmental support, have vigorously promoted medical education and relieved the teachers of a burden that was rapidly becoming intolerable and that would in all probability have produced disaster. As a business proposition education is impossible; therefore it must be supported from other and trustworthy sources.

If the present hospital system is to reach a position in which it will adequately meet the needs of the people there should shortly be made a demand by the medical profession for further and free education and training of qualified and registered doctors to become expert physicians, surgeons, and specialists of all kinds; and for such a service an appeal should be made to the Treasury so that a new and additional system of medical education and training, worthy of the standing of British medicine, shall be established upon and above the present system for the education and training of the ordinary doctor. Our present medical schools have as much to do as they possibly can; and, if report be true, many of them are suffering, on the one hand, from a plethora of students and, on the other hand, from a paucity of facilities for the technical training of the student in the work that awaits him, and of which he is expected to know and to be practised in when given a diploma or degree for placing him on the Medical Register.

It would appear that Dr. Little has hardly appreciated the fact that the voluntary hospital system is rapidly becoming transformed into the provident one, and that the success he records is mainly due to that fact. Many of the so-called voluntary hospitals are entirely supported on the provident system—weekly contributions from the workmen. Indeed even the hospitals with medical schools attached are doing their best to get themselves on that thesis so as to obtain a security in income. Were this transformation not taking place on a larger and increasing scale the plight of the hospitals would indeed be a serious one. I believe it would be better if all were now to open their eyes so as to see the new movement and to be ready to guide it so that the medical services for the people shall continue on a sound footing and be timely rearranged to meet the conditions attendant upon the provident system which is rapidly displacing the old, voluntary or charity, with their serious limitations in many directions. I am, Sir, yours faithfully,

Cambridge, Dec. 19th, 1927. JOSEPH GRIFFITHS.

THE PREVENTION OF DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—From your annotation on this subject in THE LANCET of Dec. 10th (p. 1247) I infer that the London County Council are not convinced that the claims made for toxin-antitoxin immunisation in diphtheria are fully substantiated. It has been said [1] that no case clinically resembling diphtheria occurring in a Schick-negative reactor should be accepted as diphtheria until the Klebs-Löffler bacillus has been isolated and proved to be virulent by a guinea-pig test, a condition with which I am in full agreement, providing the same routine is followed in all cases in non-immunised subjects before the diagnosis of diphtheria is accepted. If this procedure were followed I have no doubt a very considerable percentage of cases regarded as diphtheria on the result of a Schick test would have to be rejected as "diagnosis not sustained."

It would be interesting to know exactly how much of the apparent increase in diphtheria during recent years can be attributed to the practice of medical men taking a swab from the throat—often a perfectly clean throat—and on organisms resembling the Klebs-Löffler bacillus being found, notifying the case as one of diphtheria. During 1925 the number of admissions to the Birmingham Fever Hospital for diphtheria was 1999, but of these 290, or 14·5 per cent., were found to be errors in diagnosis.

"Of 772 cases in which the medical practitioner had obtained a positive bacteriological report, 391, or 50·5 per cent., on admission showed no clinical evidence of diphtheria." [2]

If we examine the figures for the London area we find that during 1925 of the 9247 total admissions to M.A.B. hospitals for clinical diphtheria, the original diagnosis was held to be wrong in no fewer than 2366 cases, or 26·0 per cent. In addition 1004 cases were admitted as bacteriological diphtheria.[2]

Sir George Newman has stated:—

"The number of cases admitted (to the Metropolitan Asylums Board Hospitals) with mistaken diagnosis is higher than it was 15 years ago. Between 1911 and 1914 the percentage of cases of diphtheria wrongly diagnosed was 12·7 in 1911, 12·9 in 1912, 15·6 in 1913, and 11·4 in 1914, while for recent years the proportion has more than doubled." [3]

Little wonder that Drs. Harries, Macfarlane, and Gilhespy say[4]:—

"Every year many hundreds of people—adults and children—who are so unfortunate as to harbour harmless

[1] Medical Research Council, Special Report Series No. 115, p. 17. [2] Ibid., p. 22.
[2] On the State of the Public Health. Annual report of the the Chief M.O. of the Ministry of Health, 1926, p. 54.
[4] THE LANCET, Sept. 24th, p. 646.

diphtheroids, are hurried into infectious diseases hospitals upon the strength of a morphological diagnosis of a culture from the swab, to the needless anxiety of relations and at considerable cost to the community."

In fact, it is common knowledge that a large proportion of cases admitted to isolation hospitals as diphtheria show no clinical signs of that disease.

The mere fact of there being a lull in the number of notifications of diphtheria following immunisation does not necessarily prove anything. During the summer I received a visit from a Swedish medical officer of health, when amongst other matters we discussed diphtheria. He told me it had almost disappeared from his town of late years, and on my asking if it was due to toxin-antitoxin immunisation my friend replied: "Certainly not. Whatever be the cause it is not immunisation, for I have not practised it and do not intend to do so, as I do not believe in it." Up to the time of writing we have had this year a very considerable fall in the number of notifications of diphtheria in Northampton, and for some three months it has apparently been almost absent from the town, there not having been a single case in a child of or under school age. Again this happy state has not been brought about by toxin-antitoxin immunisation, for it has never been attempted here. The marked fall in the numbers for 1927 is no more due to immunisation than the rise in 1926 was due to the want of it. How easy it would have been for the "Schickites" to have claimed it as a brilliant success had we practised immunisation even to a limited extent.

This is not written with the desire to prove that immunisation is useless, but merely as a reminder how careful one should be in drawing conclusions where the amount of available evidence is very limited. From what one has heard first hand from those who have worked in hospitals where Schick's method was practised, I feel for the present we must return for Schick the same verdict you brought in for B.C.G.—viz., not proven.[5]

I am, Sir, yours faithfully,

STEPHEN ROWLAND,
Dec. 14th, 1927. Medical Officer of Health, Northampton.

To the Editor of THE LANCET.

SIR,—Under this heading you state in your issue of Dec. 10th (p. 1247): "It is not surprising, therefore, that the London County Council should have decided to re-examine the need for taking fresh measures to combat diphtheria." May I beg to point out that it was only on my request that any reconsideration of their policy in this matter was undertaken, and their decision to do nothing in favour of active immunisation of school-children was a confirmation of their previous policy in this matter. You will find in referring to the report that a suggestion was made (by myself) for an experiment to be tried in two or more of the Council schools, in which diphtheria is always rife. By the voluntary immunisation of as many children as possible during the next 12 months one would then be able to compare the results with schools in which immunisation had not been tried. As is well known, the metropolitan borough councils are very little in touch with children of the age-group 2 to 5 years, so that only a fraction of the future school-children can possibly be immunised by the borough medical staffs. It is mere window-dressing to suggest, as the report does, "that those parents who desire that their children should be protected by immunisation should be given every opportunity to satisfy their wishes." Obviously parents have had very little education on this subject, and the facilities afforded by the borough councils do not apply to more than a small proportion of those children who will eventually attend school; whereas a control experiment such as I suggested would have afforded some definite evidence of the protective value of immunisation against diphtheria.

I am, Sir, yours faithfully,

Chiswick, W., Dec. 14th, 1927. STELLA CHURCHILL.

[5] THE LANCET, 1927, i., 936, and August 20th, p. 403.

SPINNERS' CANCER.

To the Editor of THE LANCET.

SIR,—If we accept Dr. Robertson's views on the origin of scrotal cancer in mule-spinners it means that a non-specific irritation such as a blow or friction ("mere traumata" as Cheatle put it in a recent issue), does and can, per se, cause cancer. The modern trend of opinion is in the opposite direction. The keratogenic agents, such as certain petroleums, coal products, arsenic, actinic, X, and radium rays have been found to be, statistically and clinically, closely associated with the appearance of malignant growths.

Every substance which irritates the skin has some special property, to which it owes its injurious activity. This physico-chemical quality may be hygroscopic, hydrolytic, protein-precipitant, oxidising, reducing, keratogenic, dependent on solubility or volatility, and so on. Without one or more of these characteristics both outside and inside the body, the agent is inert. It cannot produce a dermatitis, much less a cancer. The purely physical injuries by themselves have not been shown conclusively to be keratogenic, or neoplastic, as I have suggested elsewhere.[1] Even though we accept the dictum of Murray,[2] "that it is clear that cancer is not the direct response of the tissues to some special substance" the weight of clinical and experimental evidence is strongly in favour of some petroleum oils being important factors.

We may accept Dr. Robertson's view that the constant friction of the overalls against the left aspect of the spinner's scrotum will denude the protecting corneous layer from that part. The tissues will then be in a ready state to be acted upon by the perpetual rubbing in of any keratogenic material. The amount may be small—or even very small, as Dr. Robertson contends—but no mule-spinner in my experience admits that the scrotum is quite free from lubricating oil.

I am, Sir, yours faithfully,

Wigan, Dec. 17th, 1927. R. PROSSER WHITE.

TOXÆMIAS OF PREGNANCY.

To the Editor of THE LANCET.

SIR,—Referring to our recent report to the Medical Research Council on the investigation of cases of toxæmia of pregnancy, Dr. Chalmers Watson asks a question and makes a suggestion in the letter which you published in your last issue. May we be permitted to reply to his observations? Dr. Watson remarks that "in any series of 200 cases of toxæmia in pregnancy the examination of the urine would reveal a marked degree of bacteriuria in at least 90 per cent. of the cases" and that "the examination of the intestinal contents as voided would reveal unmistakable evidence of a high degree of abnormal putrefaction in every case." He suggests further that "it is along these lines that we will ultimately find the common cause, if such exists."

We stated in our report that there had been a full clinical examination of every case, and that cases of infection of the urinary tract had been excluded from the series. This examination naturally included a bacteriological examination of the urine, and we wish to repeat, in reply to Dr. Watson's question, that in no case was there a bacilluria or pyuria, still less a "marked degree of bacteriuria." Further, even the most pronounced cases of renal infection do not, as a rule, show the syndrome characteristic of the toxæmias of pregnancy. We have, however, noted the development of pyuria in a number of our cases. This did not occur during the acute toxic stage of the illness, but after such an interval that it is to be regarded as a complication and not as a cause of the condition.

As regards intestinal putrefaction we find it more difficult to speak, for bacteriological examination of

[1] The Clinical Incidence and Aspects of the Trade Skin Cancers, Jour. of State Medicine, 1927, XXXV., No. 9.
[2] Murray, J. A.: Research Defence Society, July, 1926, p. 12.

the stools was not carried out. If, however, we take Dr. Watson's criterion—"the sound use of the unaided senses"—then we can say that while constipation was common we have not noted any indication of "intestinal putrefaction" as we understand the term. If intestinal putrefaction or "intestinal auto-intoxication" be the cause of the toxæmias of pregnancy, as suggested by your correspondent, we find it difficult to explain the good therapeutic results which are obtained by two such different methods of treatment as the Dublin and the Stroganoff methods. The success of the Dublin method appears to support Dr. Watson's idea that intestinal toxæmia is an important causal factor inasmuch as colonic lavage is an essential part of the treatment. On the other hand, Stroganoff, who reports even better results, never washes out the colon, and empties the rectum only if it is loaded. Again, our own results are as good as those reported by the Dublin school, but the only important factor in common is starvation. We do not deny, of course, that the absorption of toxic waste products from the gut must have an injurious effect, and we advocate the stimulation of elimination by the bowel in this as in any other toxic state. We consider that more important than intestinal stasis is the effect of the ingestion of protein. Our insistence upon this point as an essential part of our method of treatment has, we regret, escaped the comment both of your correspondent and of our reviewer in your columns. It is significant, we think, that both in the Dublin method and in our own great stress is laid on the withdrawal of protein from the diet. We state in our report our reasons for suggesting that protein acts deleteriously in such cases in virtue of its protein structure and the resulting breakdown products and not because of its nitrogen content.

We are, Sir, yours faithfully,

J. N. CRUICKSHANK,
J. HEWITT,
K. L. COUPER.

Glasgow, Dec. 17th, 1927.

MEMORIAL TO THE LATE PROF. FRANCIS MITCHELL CAIRD.

To the Editor of THE LANCET.

SIR,—A number of the friends of the late Mr. Francis Mitchell Caird, a former lecturer on surgery in the Extra-Mural School and professor of clinical surgery in the University of Edinburgh, having expressed a desire to perpetuate his memory in the Edinburgh Medical School, a committee was appointed by the Medical Faculty of the University and the Council of the Royal College of Surgeons to consider what step should be taken for this purpose.

The committee and the two bodies which it represented decided that the memorial should include a prize and medal open for competition to graduates of the University and Licentiates and Fellows of the Royal College of Surgeons of Edinburgh who have studied for two years in Edinburgh and have been qualified as practitioners for not more than seven years. The prize, offered biennially, will be awarded for the best essay in surgery or surgical pathology based on personal observation and research, the subject being chosen by the candidate.

Subscriptions of £1 1*s.* and upwards will be gratefully received. Those who have not been approached directly by the committee and are desirous of subscribing are invited to send their subscriptions by cheque or postal order, payable to the Francis Mitchell Caird Memorial Fund, per the accountant of the University, and addressed to him at the University of Edinburgh, Old College, Edinburgh.

We are, Sir, yours faithfully,

ALEXANDER MILES,
President, Royal College of Surgeons of Edinburgh.

J. LORRAIN SMITH,
Dean of the Medical Faculty, University of Edinburgh.

Edinburgh, Dec. 17th, 1927.

MERCUROCHROME INTRAVENOUSLY.

To the Editor of THE LANCET.

SIR,—In response to the wish expressed by Mr. W. H. Martindale, Ph.D., in his letter to THE LANCET of Dec. 10th I send a brief report of experience with the intravenous injection of mercurochrome 220 in cases of acute and chronic gonorrhœa in adult males. Last year 14 cases of gonorrhœa under my care as out-patients in the V.D. department at Guy's Hospital were treated with a series of intravenous injections of mercurochrome 220; three of these cases were suffering from acute gonorrhœa with no complication, the remainder were in the chronic stage and suffering from chronic prostatitis, seminal vesiculitis, or both. The scheme of treatment was as follows:—

First day	..	10 c.cm.	of 0·5	per cent. mercurochrome.
At intervals of 2–3 days later		20 ,,	0·5	,,
		10 ,,	1·0	,,
		10 ,,	1·0	,,
		20 ,,	1·0	,,
		20 ,,	1·0	,,
		20 ,,	1·0	,,

Ten of the 14 cases completed this series of injections; in a few there were slight variations in the time intervals between injections and in the quantity of the injections. No serious or marked reactions were encountered following injections in any of these cases, but slight reactions were noted in five cases—viz.: (1) transient vomiting and diarrhœa, (2) vomiting only, (3) a feeling of general malaise, (4) diarrhœa for two days, (5) abdominal pain but no vomiting or diarrhœa.

There appeared to be no definite correlation between these reactions and the concentration of the injection or the quantity of mercurochrome; the relationship is expressed below.

No. of injection.	Quantity.	Concentration.	No. of slight reaction.
10	10 c.cm.	0·5 %	2
5	20 c.cm.	0·5 %	1
22	10 c.cm.	1·0 %	2
22	20 c.cm.	1·0 %	2

In all cases, with one exception, further injections were given following the reaction and in one only was a second reaction experienced. In three of the cases under treatment the urine or urethral discharge was noted to be coloured pink; this was associated with a reaction (vomiting) in one case only. All the cases under treatment were young adult males attending as out-patients after their day's work had ceased; apart from the urethritis or its complications they were all in good general condition.

The injections administered were from bulk solutions of mercurochrome in distilled water, which were stored in glass flasks in the dark; such solutions were used up to 14 days from the date of preparation. In two cases the mercurochrome solutions utilised for the series of injections contained 50 per cent. glucose, no reactions were experienced in either of these two cases.—I am, Sir, yours faithfully,

Devonshire-place, W., Dec. 13th, 1927. V. E. LLOYD.

THE REMOVAL OF TONSILS: A "BLOODLESS" METHOD.

To the Editor of THE LANCET.

SIR,—Although I have had a vague knowledge of the existence of a La Force guillotine and a dubious opinion on its "bloodless" surgery for some time, it was not until this year that I saw it in use.

Feeling that there may be many, who, as I was, are ignorant of its value, I venture to bring to your notice an instrument which has been in constant use in America since 1914. Very briefly described it is a guillotine of the Sluder type, but possessing two blades, one a crusher and hæmostat, the other a cutter. The tonsil is engaged in the fenestra of the

instrument and the crushing blade forced down external to the capsule in the usual way. The crusher is now held firmly in position by a screw and thread arrangement for five minutes, accurately timed by watch or sand-glass, as used for timing egg-boiling. The screw attached to the cutting blade is now brought into action and the tonsil cut off just medially of the tissues held by the hæmostat blade. It is then removed by forceps. The screw holding the hæmostat down is now turned in opposite direction and the guillotine removed.

In favourable cases the tonsils may be enucleated with the loss of only a drop or two of blood, just enough to colour the mucus in the pharynx: there is no need for swabs—and in my cases there has been no bleeding later. It must be acknowledged that there is an occasional failure, for the instrument is not so easy to use as the O'Malley or Ballenger guillotine, then resort must be had to dissection. But the same occasional failure must be laid to all guillotines, as I am certain that there are tonsils, though very few, which can only be removed by dissection. I am convinced that wherever possible the guillotine should be used as no dissection operation that I have done myself, or seen others perform, leaves such a clean and regular fossa or causes so little trauma.

A very similar instrument, but one which I have not seen, was devised by W. Hill and G. Elphick in 1914, and I should be very interested to know their views on the method after this lapse of time.

I am, Sir, yours faithfully,

Manchester, Dec. 6th, 1927. LINDLEY SEWELL.

ALKALI TREATMENT IN FEVERS.

To the Editor of THE LANCET.

SIR,—In reply to Dr. Osman, my results are very relevant to the question of the alleged benefit of alkalies in preventing nephritis in scarlet fever, because we have found on a former occasion that, if the alkali debt of the tissues, incurred in the acute stage, is repaid during that stage, no evidence can be obtained of any acidosis throughout convalescence. To confirm this observation, I have recently tested the alkali tolerance of 62 patients in the third week of disease whose urine had been rendered alkaline during the acute stage by repeated four-hourly doses of 1 to 2 g. of alkali (doses according to age).

The urine of a normal child on a mixed diet can be usually rendered alkaline with 5 g. of soda and that of an adult with 10 g. In this group, in 6 cases the urine was rendered alkaline with 1 g., in 13 with 2 g., in 18 with 4 g., in 16 with 5 g., in 4 with 7 g., in 2 each with 8, 10, 12, and 14 g. respectively. Those needing the larger doses were adults and adolescents, those with smaller doses were children. These doses were administered in the same manner as in the acute stage, each specimen of urine being tested with litmus immediately on passage. It will be seen that the alkali tolerance of these patients is rather less than normal, indicating that there is no alkali deficiency during convalescence after treatment with alkalies in the acute stage. Moreover, the urine remained alkaline in 50 per cent. of the cases for the succeeding 24 hours after stopping their administration.

I think, therefore, it is a justifiable conclusion from my experiment, extending over 17 years and 8000 cases, that, if the incidence of nephritis is almost identical in those with a deficient alkaline reserve and those whose alkaline reserve has been restored to normal, such a deficiency cannot play any very important part in the ætiology of this particular complication.—I am, Sir, yours faithfully,

B. A. PETERS.

Ham Green Hospital, Bristol, Dec. 19th, 1927.

ELIZABETH GARRETT ANDERSON HOSPITAL.—On Dec. 15th the foundation-stone of the new extension building was laid by Sir Alan Garrett Anderson, the son of the founder. The sum of £70,000 has been raised towards enlargement of the hospital.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

MEDICAL AND DENTISTS ACTS AMENDMENT BILL.

IN the House of Commons on Friday, Dec. 16th, Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) in moving the second reading of the Medical and Dentists Acts Amendment Bill, said that the Bill embodied an agreement between the Irish Free State and this country which was designed to meet an administrative problem resulting from the establishment of the Irish Free State and the legislation consequent thereon. As a result of that legislation the General Medical Council ceased to exercise any authority or control over the medical profession in the Irish Free State, and also ceased to be able to place on the Register here students who obtained their medical qualification in the Irish Free State. That position was regarded on both sides as unsatisfactory and negotiations had been taking place for some time. In the meanwhile by an interim arrangement the General Medical Council had agreed to accept for the Medical Register here students with qualifications obtained in the Irish Free State. One of the objects of the Bill was to validate that arrangement. An agreement was reached in the early part of this year which was set out as Part 1 of the Schedule of the Bill. In this matter the British Government had been assisted by Sir Donald MacAlister, the President of the General Medical Council, and the agreement had the concurrence and the support of the Council. On the one hand the General Medical Council would continue to admit to the United Kingdom Register all persons who prior to the establishment of the Irish Free State would have been admissible in respect of qualifications obtained in the area which was now the Irish Free State. Secondly, they would have all the power formerly possessed by them of controlling the examinations giving the right of such admission so far as was necessary for keeping the United Kingdom Register. On the other hand, the Irish Free State would establish an Irish Free State Register and would have complete control of that Register in the Irish Free State. Provision was made for admission to the Register on equal terms of all persons on the United Kingdom Register. The position in regard to the Dentists Act was practically similar, and it was embodied in Part 2 of the Schedule. The agreement required legislation in both countries, and in the Free State legislation had been passed to give effect to the medical part of the agreement and had received the Royal Assent. The legislation in regard to the dental side in the Irish Free State would involve two Bills, and he understood that that legislation was now going through. He thought that this was a happy solution of the difficulties that had arisen.

The Bill was read a second time.

NURSING HOMES (REGISTRATION) BILL.

On the consideration of the Nursing Homes (Registration) Bill,

Captain CAZALET moved the following new clause to give power to the Minister of Health to exempt Christian Science nursing homes:—

"(1) The Minister of Health may grant exemption from the operation of this Act in respect of any nursing home, as respects which he is satisfied that it is being or will be carried on in accordance with the practice and principles of the body known as the Church of Christ Scientist. (2) It shall be a condition of any exemption granted to a nursing home under this section that the nursing home shall adopt and use the name of Christian Science Nursing Home. (3) An exemption granted under this section in respect of a nursing home may at any time be withdrawn by the Minister if it appears to him that that home is no longer being carried on in accordance with the said practice and principles."

He said that the first clause of the Bill made it compulsory for any nursing home in the future to have in charge of it a qualified medical doctor or a qualified nurse. The method of healing disease as practised by Christian Scientists was entirely different from that of the medical profession. It was obvious, therefore, that if there was to be a qualified medical man or a qualified nurse at the head of these homes there must be a period when either he or she would disapprove of the methods adopted in the Christian Science homes. Those homes did not take maternity cases, cases requiring surgical operations, or cases of infectious disease. There were at present 30 or 40 of these homes in England and Wales. If they could not obtain exemption under the Bill the result would be that Christian Scientists would be subjected to an intolerable amount of persecution merely for their religious convictions. The only other alternative was that these homes should be closed. No attempt was made under this new clause to evade any of the rules and regulations in regard to ventilation, sanitation, or such

matters. These homes were prepared to submit to any degree of inspection and registration desired by the Ministry of Health, and he understood that the new clause conformed in every way with the requirements of that Department.

Viscountess ASTOR seconded the new clause.

Sir CYRIL COBB, speaking as a member of the Select Committee, said he thought the new clause raised some difficulty. The main object that the Select Committee had before it, and which was embodied in the Bill, was to ensure that in all institutions which professed to be nursing homes there should be qualified nursing service for the public. They were not willing to make any exemptions whatever except those contained in Clause 6 of the Bill, and those were cases where people were in institutions of the nature of nursing homes for which they did not pay. They had among others cases of medical men who kept nursing homes where they received patients for fees, and a very great deal of evidence was given and pressure brought to bear upon the Committee to induce them to make a recommendation that in all cases where nursing homes were run by a medical man for gain there should be an exemption from the provisions of the Bill. They were told that the General Medical Council would ensure that such homes were properly run and provided with qualified nurses. The evidence, however, which came before the Committee showed that some of the very worse cases of neglect occurred in these nursing homes run by doctors, and the Committee found it quite impossible to make any recommendation for the exemption of such homes. The House was not dealing with a religious question at all, but with a medical question involving the protection of the public, and they should be very chary of making an exemption in the case of this particular religious body which wished to conduct treatment in homes of a special character entirely and absolutely distinct from what was generally known as nursing treatment. They had defined in the Bill what a qualified nurse was, and had provided throughout that qualified nurses were to be employed in these homes. The only relaxation of these rules was in connexion with nursing homes in existence at the present moment, and which would be carried on under regulations made by the local authorities. A certain amount of time was allowed to such homes in which to get a better staff, but in all other cases the Committee felt that no exception should be made. Therefore it was extremely difficult for him as a member of the Select Committee to agree to this clause. He must vote against it, although he did not do so with any idea of injuring a particular religious body.

Mr. MORRIS said if people believed that exemption should be granted why did they say that only permissive power to exempt should be granted to the Ministry of Health? It seemed to him to indicate that the supporters of the clause had no clear belief in their own case. Another objection he had to the clause was that it was taking the Minister of Health away from his proper duties and turning him into a theological expert. Why should the Minister of Health be the High Priest of the Christian Science Church and see that their homes were properly conducted? By allowing the name of Christian Science nursing home they were opening a new loophole. Many homes might adopt that name, and how were they to prove that people were qualified Christian Scientists? He hoped that the clause would be defeated.

Sir RICHARD LUCE said that as a member of the Select Committee he opposed the clause for several reasons. The evidence before the Committee made it perfectly evident that it was not wise to grant exemption to homes run by medical men. It would therefore be very unfair that an exemption should be given to any other body. The mover of the clause had stated there were something like 30 or 40 Christian Science nursing homes in the country. That was not at all in accordance with the evidence given to the Committee by the representative of the Church. At that time he said that there were only three Christian Science nursing homes in the country, but there were other places where patients could go to receive treatment which could not in any way be called nursing homes. He said they were a kind of boarding-house. There had either been an enormous growth in the number of Christian Science nursing homes during the last year, or else the boarding-houses were now being included. If the great majority of those homes were such as need not come under the name of "nursing home" there would be no very great hardship in closing down the few that were definitely nursing homes. But if they were really to become nursing homes there should undoubtedly be control over them to see that they kept up to the standard exacted in the case of other nursing homes. Under this clause there seemed to be no proper guarantee that the homes which were to be exempted under it would be properly inspected. The Minister did not take the responsibility of inspecting them. The evidence before the Committee was that there was absolutely no body which controlled these homes in any way. In fact, the representative of the Central Body knew extraordinarily little about the homes at all. He said that it might be possible to set up a central body to control the homes under directions from Boston, but at the time there was no such body in existence. That was a very nebulous state of affairs. There were many other methods of treatment in vogue in this country besides those of orthodox Christian Science. What was there to prevent in the case of any of those other methods the setting up of homes, and if this exemption was given how could any Minister of Health justly claim to refuse exemption in those cases also? It seemed to him that they were setting up a very dangerous precedent which would be very difficult to resist in the future. He hoped the House would not agree to the clause.

Mr. NEVILLE CHAMBERLAIN (Minister of Health) said he was not a Christian Scientist and he did not profess even to know what were the tenets of Christian Science, but so far as it was the practice of Christian Science to substitute for medical and surgical skill some other methods he entirely disapproved of it. But he wished to ask the House to consider what would be the effect of rejecting the clause and consequently bringing institutions carried on by Christian Scientists under the provisions of the Bill. They were not concerned with the doctrines of Christian Science; what they were concerned with in this Bill was to see that no member of the public was deceived into entering one of these institutions under the impression that it was a nursing home in the sense in which that term was generally used. Christian Science was not carried on as medical treatment; it was not a species of quackery which pretended to be something that it was not. They might agree or they might not agree with it, but there was no pretence that Christian Science treatment was an alternative to medical treatment or was a variety of medical treatment. Without some form of exemption there was little doubt that these homes would come within the provisions of the Bill and be required as a condition of continued existence to appoint a qualified nurse to be resident in the home as its superintendent. But to do so would be contrary to their beliefs. It would be a case of camouflage and the result would be to do the very thing some of his hon. friends wanted to prevent. They would be deceiving or likely to deceive the public. On that account he suggested to hon. Members who were alarmed at these things that they were unwise to attempt to bring these homes within the provisions of the Bill. If such a home refused to appoint a qualified nurse it would be closed. Could they contemplate the possibility of doing that?

Dr. VERNON DAVIES said that the Bill referred to homes which were nursing homes. If the Christian Scientists referred to their homes as homes of rest or homes of treatment they would not come under the Bill at all and would not deceive the public.

Mr. CHAMBERLAIN said that was not a matter which a layman could decide; it was a legal question. It all depended whether institutions of the kind which they were discussing would come within the definition of nursing homes in the Bill, and he was advised that they would. Unless persons who desired Christian Science treatment could obtain it in their own homes it seemed to him that there would be great force in the argument of Captain Cazalet that this would be regarded as a piece of religious persecution. These were the considerations which had led him to think that the inclusion of these institutions under the provisions of the Bill offered difficulties so serious that he could not contemplate it with complacency. He had therefore to consider what was the other alternative, and in doing that he had had in mind the only consideration which concerned him—namely, the protection of the public. Provided that it was possible to isolate these particular institutions, separating them from such homes as might be set up by unqualified persons posing as medical practitioners; provided that one could get some test by which they could be separated, and could ensure that they could not call themselves by a title which would give rise to misunderstanding; and if one could also provide a safeguard so that on any change taking place in the situation an exemption could be withdrawn, then the objects which he had in view could be secured. He thought that with one exception the clause moved by Captain Cazalet carried out his (Mr. Chamberlain's) ideas. He agreed with Sir Cyril Cobb in his protest against the exemption of any kind of nursing home; but the whole point was that the Christian Science homes were not nursing homes. It seemed to him that the weak point of the clause as it stood was that they were still to be called nursing homes and he would suggest to the mover of the clause that he should use some other title which would separate those institutions entirely from nursing homes and afford no excuse to anyone to say that he had gone there under a misapprehension. He thought that they might be called "Christian Science Houses," a term which did not involve any suggestion of medical practice.

Captain CAZALET said that he had put down the clause in its present form because they were informed that that was the best way. They were willing to take any name to effect their purpose which the Minister might suggest and which would be agreeable to the House.

Mrs. PHILIPSON said that she thought that a great difficulty would be removed if the suggestion of the Minister was adopted. She was anxious, not only from the point of view of the medical and nursing professions, but also from the point of view of the public, that all these homes should be registered and be under the control of the Minister of Health. She had been told by the chairman of the Christian Science Church that the members of that Church were perfectly willing that their homes should be registered, and if that course was taken there would be no loophole for anyone to set up a nursing home for any other purpose. She hoped that the mover and seconder of the clause would not insist upon any course which would jeopardise the passing of the Bill.

Lieut.-Colonel FREMANTLE said that he would accept the new clause at once if he had simply to consider the question of helping the work of Christian Science nursing homes so far as they were relieving people and so far as this question was concerned with liberty of conscience and freedom of experiments. But he hoped the House would recognise how grave was the position of medical men in being called upon to make such an exemption. What they were concerned with was the protection of the public. He had nothing to say against these particular homes and he knew nothing about them. The Minister of Health knew nothing about them, and the House had not been informed in that respect. They were being asked to give a blank cheque not only to these homes but to any others who came along with the same credentials. He understood that there was no body in this country representing the Christian Science faith which could certify these homes. If the Christian Science movement had been able to increase the number of its nursing home from 3 to 37 in 12 months what was to prevent them going ahead at the same rate? These places would be well equipped because they belonged to an affluent community. They would attract people who had diseases and it would become practically impossible to know whether they were nursing homes or not. The more ignorant portion of the public did not know the difference between Christian Science and any other science, and he was afraid that this would be opening the door to wide deception of the public. If they opened the door to this extent how could they prevent it being opened to say the much older and more widespread cult of homœopathy? Yet the proposed new clause did not provide for any such exemption. It would be the same with the osteopaths. The proposed exemption seemed to him most dangerous. He would like to know whether the Minister and his officers would have the right of inspection. If so, should that not be put into the clause? Personally he could not vote for the clause unless they had some definite understanding of how it was going to be carried out and how the position stood in relation to the safety of the public.

Mr. G. HURST said that he had intended to oppose the clause, but the concession which had been made by the mover seemed to him to remove all the suspicions and distrust which its opponents entertained.

Mr. C. EDWARDS said that he was very suspicious of people holding these peculiar ideas and he thought that if any registration or control was necessary in nursing homes or anywhere else it was also necessary in homes carried on by these peculiar people. Unless these places could be placed altogether outside the category of nursing homes he thought the House ought not to agree to the clause.

Dr. VERNON DAVIES said that he was grateful to the Minister for the suggestion he had made because he thought that the alterations of the words "nursing home" to "house" got over a very great deal of difficulty. Although he spoke as a medical man he could not associate himself fully with the speech of Lieut.-Colonel Fremantle. They had to recognise in this country that people had a right to their own opinions, and if they were adults they had a right to do what they liked with their lives. If a certain section of people in this country believed that the principles of Christian Science were such that they could get a better effect from them than from the ordinary medical and surgical skill that was available they had a perfect right to hold and act upon that view; and if it was necessary that homes or houses should be provided for that particular kind of treatment they had a right to go into them. Neither medical men nor Members of Parliament had a right to interfere provided they were assured that the public were safeguarded and were not deceived. Whether such persons when they got into these homes would be well or ill treated was not the concern of the community; they had gone there of their own free will. He thought, therefore, that the House could with safety accept the new clause subject to redrafting. He would suggest, however, that the Minister of Health should require that the head of the Christian Science religion in this country should actually certify that a particular place was one of their houses carried on according to their principles and thus place the onus on him.

Sir KINGSLEY WOOD said that the head of the Church would give that certificate. He suggested that they should insert in the second paragraph the word "house," and he would undertake that before the Bill reached the House of Lords the question of using some other word such as "institution" would be considered.

The clause was read a second time.

On the motion of Captain CAZALET the words "nursing home" were deleted from the clause and the word "house" was inserted.

The clause as amended was added to the Bill.

Mr. G. HURST moved an amendment to Clause 5 (Inspection of Nursing Homes) with the object of emphasising to those who had to administer the Act, that when a medical officer of health deputes some officer to visit and inspect these nursing homes he should bear in mind that the official primarily qualified to deal with questions of nursing was a qualified nurse.

Miss WILKINSON seconded the amendment which was agreed to.

Mr. CHAMBERLAIN moved amendments to Clause 8 to provide that the council of every county as respects that county and the council of every county borough as respects that borough shall be the local supervising authority under the Act; and authorising a county council to delegate to a district council any of its powers under the Bill.

The amendments were agreed to and the Bill was afterwards read a third time.

HOUSE OF LORDS.

FRIDAY, DEC. 16TH.

MENTAL DEFICIENCY BILL.

The Mental Deficiency Bill was read a second time on the motion of Viscount GAGE.

LANDLORD AND TENANT BILL.

The Landlord and Tenant No. 2 Bill was considered on Report.

On Clause 17 (which deals with the holdings to which Part 1 of the Bill applies),

The Duke of NORTHUMBERLAND moved to insert at the end of Subsection 3 the words: "A profession for the purpose of this section means the habitual and regular practice of a learned or skilled profession as the chief means of livelihood." He said that unless the word "profession" had a definite meaning in law, owners of house property could not possibly know where they stood under this Bill or what obligations or commitments they might incur. Surely the object of adding professions to businesses and trades was that the Act should apply to those learned and scientific professions which were absolutely essential to any civilised society—namely, lawyers, solicitors, doctors, dentists, surveyors, and so forth. He was not necessarily wedded to this particular definition, and if the Lord Chancellor was prepared to consider the possibility of a better definition than the one he had suggested he would be very happy to accept it.

Viscount SUMNER supported the amendment. He thought it was essential that there should be some attempt at definition and the difficulties which were not inconsiderable should not deter them from making such attempt. If one could be sure what the policy was which underlay these words in the Bill it would be much easier to say what a profession within the scope of that scheme was meant to be. As the matter stood it appeared to him that in every case it would be a question of fact whether or not premises were used for carrying on a profession. It would be a question of the user of the premises. He thought that the person who used X rays and produced an ambiguous and unattractive picture of a patient's abdomen was a very good instance. He was a person whom no one, he thought, would regard as a tradesman, and he did not think that they could call him a business man. But if he belonged to a profession, what profession did he belong to? There were other cases that could be suggested without difficulty and they amounted to quite a considerable number, particularly in large cities. In default of a better the amendment of the noble Duke was one which he would cordially support. It would be an improvement to the clause on the plain and simple ground that it would tend to reduce the number of disputes.

The LORD CHANCELLOR said that the Bill prima facie applied to premises used for trade, but the same difficulties might occur in regard to premises used for professions.

For instance, there was the case of a doctor who wanted to add a surgery to his house. Surely it was reasonable that if it was desired to make an improvement of that kind, and if at the end of the term some value remained to the landlord, the tenant should have compensation for the unexhausted value of the improvement. The professional man had no right in respect of goodwill, because the goodwill of a profession was personal goodwill and was in no sense attaching to the property. The noble Duke wanted to go through the perilous process of defining the word "profession." What profession was not learned or skilled? He believed that those words would raise rather difficult points for determination. The amendment also proposed to provide that the profession must be carried on as the chief means of livelihood. Were they to inquire whether the doctor or other professional person had means of his own on which he partly or perhaps mainly subsisted? At the outset it might be that he got very little profit from his profession and might have to rely on his private income. Were they for that reason to cut him off from compensation if having found the money for a surgery and so forth he subsequently left it? It seemed to him that that would be not only dangerous but unfair. The other qualification was that it must be "habitual and regular practice." There he had some sympathy with the noble Duke, and would like to meet him. If he agreed and was prepared to withdraw his amendment he (the Lord Chancellor) would move to insert in the proviso in Subsection 3 the word "regularly."

The Duke of NORTHUMBERLAND withdrew his amendment and the Lord Chancellor's suggested amendment was agreed to.

HOUSE OF COMMONS.

WEDNESDAY, DEC. 14TH.

Sickness and Mortality among Troops in China.

Mr. TREVELYAN asked the Secretary of State for War (1) what the statistics of sickness and mortality had been in the British force in China in the months of July, August, September, October, and November; and (2) what the statistics of sickness and mortality had been in the British force at Shanghai in the months of July, August, September, October, and November.—Commodore DOUGLAS KING (Financial Secretary to the War Office) replied: The information is as follows: 1. Approximate average number in hospital at Hong Kong, Shanghai, Tientsin, Pekin, and Wei-hai-Wei:—

Month.	Officers.	Other ranks.
July	39	1309
August	25	1132
September	24	1191
October	14	799
November	13	713

2. Number of deaths among the troops not forming part of the permanent establishment in China, which have been reported to date:—

During the month of—	Died—		
	of illness.	of wounds.	by drowning.
July, 1927	6	—	—
August, 1927	9	—	—
September, 1927 ..	5 (*a*)	1	1
October, 1927 ..	4	—	—
November, 1927 ..	—	—	—
Totals	24	1	1

(*a*) Includes one officer.

Loss of Working Days through Sickness.

Mr. SMEDLEY CROOKE asked the Minister of Health the loss of working days caused by sickness during the years 1925 and 1926.—Mr. CHAMBERLAIN replied: There are no data available as regards the general population. As regards persons insured under the National Health Insurance Act (some 14,000,000 in England and Wales), it has been estimated by reference to the sums paid by way of sickness and disablement benefit under the Act, that the time lost by sickness in England and Wales was:—During 1925 upwards of 150,000,000 working days; during 1926 upwards of 169,000,000 working days. In making these estimates account has to be taken of a number of uncertain factors, and the result can only be regarded as a rough approximation.

THURSDAY, DEC. 15TH.

Dangers in the Use of Acetylene Plant.

Mr. GIBBINS asked the Home Secretary whether his attention had been called to the recent fatal accident whereby two boilermakers using an acetylene burner were gassed and burnt to death inside the tank of a ship in Clarence Dock, Liverpool; and if he would consider whether special regulations are needed to minimise the dangers caused by the use of mechanical appliances in confined spaces.—Sir WILLIAM JOYNSON-HICKS replied: The circumstances of this accident were exceptional. It was due to the men having blown a large quantity of oxygen into the confined space of the tank for the purpose of removing some smoke which had accumulated there from a smouldering sack and having then entered the tank with a lighted candle. The accident was not connected in any way with the use of acetylene plant, but I may say that the danger from fumes or gas in connexion with such plant is fully recognised and special precautions against it are proposed in the draft new Shipbuilding Regulations.

Small-pox at Newcastle Workhouse.

Mr. GROVES asked the Minister of Health how many cases of small-pox had been reported from the workhouse at Newcastle-on-Tyne; how many of them had been vaccinated or revaccinated; when was the last general revaccination of the inmates prior to this outbreak; and whether any inmates recently vaccinated or revaccinated who were attacked by small-pox were suffering from any other disease at the time of the attack.—Mr. CHAMBERLAIN replied: Forty-five cases of small-pox have recently occurred in the Newcastle-on-Tyne Poor-law Institution. Forty-two of these cases had, at the time of infection by small-pox, been vaccinated in infancy only, and their ages ranged from 17 to 70 years. In addition, one had been revaccinated ten years ago. Prior to the present outbreak there has been no general revaccination of the inmates during the past 15 years. The answer to the last part of the question is in the affirmative, but in none of these cases was the vaccination successful.

Municipal Sunlight and Vapour Baths.

Lieut.-Commander KENWORTHY asked the Minister o Health whether his attention had been called to the success of the recently opened sunlight and vapour baths of the Hull Corporation; and whether he would recommend a similar system to other municipalities.—Mr. CHAMBERLAIN replied: I am aware of the establishment referred to, and recently paid a visit to it myself. While I regard the Hull baths as an interesting and valuable experiment, I do not think it has been long enough in existence to justify the somewhat unusual step proposed.

Mr. GROTRIAN: Will the right hon. gentleman take care that these baths are not instituted except under proper expert advice and management?—Mr. CHAMBERLAIN: I do not think there is any deficiency in that respect.

Lieut.-Commander KENWORTHY: Is the right hon. gentleman aware that the chairman of the Baths Committee is a senior medical practitioner?—Mr. Chamberlain: I do not think there is any reflection to be made on these baths.

Lay Practitioners and Electrical Treatment.

Mr. HARDIE asked the Minister of Health whether he would take steps to obtain powers of control over lay establishments for treatment by ultra-violet and other radiations.—Mr. CHAMBERLAIN replied: The object sought in the question could only be obtained by legislation, and I am not, as at present advised, prepared to introduce legislation for the purpose.

Scientific Societies and Income-tax.

Mr. CLAYTON asked the Chancellor of the Exchequer whether he was aware that, pending the decision of certain cases before the High Court, the return of income-tax to certain scientific societies hitherto regarded as charitable institutions was being withheld; and, as such action, especially in the cases of those societies which have annually to distribute funds for research purposes, was a hardship and one which must necessarily curtail research work carried out in universities and university institutions, would he arrange to have these taxes refunded.—Mr. CHURCHILL replied: Appeals in the High Court are pending against decisions of the Special Commissioners of Income-tax holding that two societies were not entitled to exemption from income-tax as charities. These two societies, after discussion between representatives of a large group of learned and scientific societies and the revenue authorities, had been taken as test cases. Unless these decisions of the Special Commissioners on appeal are reversed by the courts, it would not be possible for the Inland Revenue to continue to make repayments of tax in respect of income of the general funds of other societies of the same character. If, however, my hon. friend is aware of any cases in which relief has not been admitted in respect of income which is subject to a specific trust for application to research in a university or university institution, I shall gladly make

further inquiry on being furnished with the necessary particulars.

MONDAY, DEC. 19TH.

Public Hospital Accommodation in India.

Mr. SCURR asked the Under Secretary of State for India whether any information was available as to the provision of public hospital accommodation in British India in relation to the needs of the population.—Earl WINTERTON replied: The latest information available relates to the year 1925. The total number of State, public, local, and private aided hospitals and dispensaries in British India in that year was 3972, and the number of beds available 45,049. The numbers of indoor and outdoor patients treated were 738,570 and 4 0,472,780 respectively.

Women's Hospitals in India.

Mr. SCURR asked the Under Secretary of State for India how many women's hospitals existed in British India both for maternity and general cases.—Earl WINTERTON replied: The total number of female hospitals and dispensaries in British India recorded in the official reports for 1925 was 173 with 4249 beds available. The number of beds available for women in general hospitals was 11,260.

The Services.

COMMISSIONS IN THE ROYAL ARMY MEDICAL CORPS.

A LIMITED number of commissions in the Royal Army Medical Corps, not exceeding 25, will be offered in January next. Applications for consideration should reach the Under Secretary of State, War Office (A.M.D.I.), Whitehall, London, S.W. 1, not later than Jan. 10th, 1928. There will be no entrance examination.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capts.: J. H. Fergusson to *Egmont* for hospital ship *Maine*; and W. W. Keir to *Tamar* for R.N. Hospl., Hong-Kong.

Surg. Comdrs.: H. M. Whelan to *Egmont* for hospital ship *Maine*; T. Creaser to *Hood*, and as squadron medical officer; G. D. Walsh to *Revenge*; B. R. Bickford to *Iron Duke*, as squadron medical officer and as specialist in ophthalmology; T. W. Jeffery to *Nelson*, and as fleet medical officer; F. J. D. Twigg to *Victory*, for Haslar Hospl., and as specialist in ophthalmology; A. R. Schofield to *Vernon*; G. H. Hayes to *President*, for six months' post-graduate course; H. H. Ormsby to *Dartmouth*; G. A. S. Hamilton to *Tiger*; and H. E. Perkins to *Osprey*.

Surg. Lt.-Comdrs.: B. S. Collings to *Nelson*; J. F. Ainley to *Victory*, for R.N. Barracks; and G. E. Heath to *President*, for three months' post-graduate course.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Capt. W. K. Wills is placed on the Ret. List.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. S. B. Smith, having attained the age fixed for compulsory retirement, retires on ret. pay.

Maj. J. H. Campbell to be Lt.-Col., vice Lt.-Col. S. B. Smith to ret. pay.

Temp. Lt. A. Nicolson relinquishes his commn.

D. W. Stuart to be Temp. Lt.

ARMY DENTAL CORPS.

Lts. to be Capts.: J. B. Cowie, R. E. Edwards, and F. S. S. Whiter (Temp. Flying Officer, R.A.F.).

TERRITORIAL ARMY.

Maj. G. E. J. A. Robinson, having attained the age limit, is ret. and retains his rank, with permission to wear the prescribed uniform.

ROYAL AIR FORCE.

Flight Lt. E. A. Wheeler (temporary Major, Dental Surgeon, General List) is promoted to the rank of Honorary Squadron Leader.

DUNDEE ROYAL INFIRMARY.—The directors of this institution have received notification that the trustees of the late Sir James Duncan have set aside £30,000 for the Infirmary out of the residue of the estate.

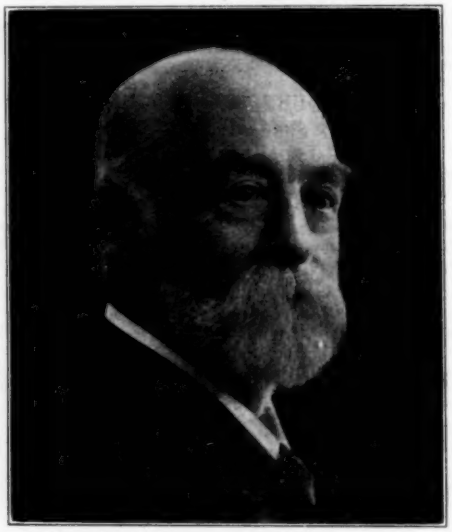
Obituary.

AMAND McCONNEL ROUTH, M.D., B.S., F.R.C.P. LOND.,

CONSULTING OBSTETRIC PHYSICIAN TO CHARING CROSS HOSPITAL.

WE regret to announce the death of Dr. Amand Routh, the well-known obstetric physician, which occurred at his country house, Grimston Court, near Folkestone, on Dec. 18th, in the seventy-fourth year of his age.

Amand Jules McConnel Routh, son of the late Dr. C. H. F. Routh, whose work and writing in the same sphere as that of his son were prominent in their day, was born in 1853, and received his early education at King's College School. Later he joined the medical school of University College Hospital. Having taken the double diploma of the English colleges he graduated in medicine at London University in 1881, proceeding to the doctorate in the following year, when he also took the M.R.C.P.



DR. AMAND ROUTH.

He was promptly elected physician to the Marylebone Infirmary and was also appointed anæsthetist at the Samaritan Free Hospital for Women, where his father was a member of the medical staff and where he also became out-patient physician; but in 1883 he was elected obstetric physician to Charing Cross Hospital, a post which he held for 30 years. He remained on the staff of the Samaritan Hospital also until 1901, and his distinguished career in his specialty justified the early openings thus offered him, for his work here and at Charing Cross Hospital advanced him to a leading position in gynæcology and obstetrics not only in London but throughout Europe. The staff at Charing Cross were at this time reinforced by four distinguished recruits from University College, and Routh was their last survivor—the others being Frederick Mott, Stanley Boyd, and Montague Murray—and at the hospital rules were abrogated at once in Routh's favour, whereby abdominal operations, unless upon a pregnant patient, were performed by a surgeon of the hospital and not by the obstetric physician. Routh made admirable use of the opportunities thus afforded, for he became known as a skilful surgeon along the many lines thus opened up. The professional confidence reposed in him was shown by his selection by the

English Royal Colleges to represent them at the Fifth International Congress of Obstetrics and Gynæcology held in St. Petersburg in September, 1910. His report dealt with Cæsarean section in Great Britain and Ireland, and included tables of 1282 cases of the operation as performed by over 100 living operators. At this date extra-peritoneal Cæsarean section was of recent introduction, and the subject was much discussed both on its merits as an operation and in reference to the conditions of its performance, there being no common agreement as to how far an answer had been supplied to the difficult question—what is the correct treatment to adopt in the case of women with contracted pelves, who are in labour, and who are possibly or probably already infected? Routh's report formed the subject of a debate which he himself opened at a meeting of the Section of the Royal Society of Medicine, and although there was no general endorsement of his views, he was allowed to have helped greatly in indicating the difficulties. The discussion proved that in clean and suitable cases, at dates fixed beforehand, without previous attempts at delivery, the mortality of Cæsarean section could be reduced to something like 2 per cent.

With another side of his science Routh's name will always be intimately connected—namely, antenatal pathology. An early supporter of the Council of the National Association for the Prevention of Infantile Mortality, he made a special study of the antenatal conditions and of the directions in which medical supervision might obviate disasters. He put forward his views before the Royal Society of Medicine in 1914, when he opened a debate on the subject, urging the need of research. Allowing for the essential differences in the physiological and pathological activity of the embryo and the fœtus, he pointed out that in either case disease might lead to abortion or premature labour, and he dwelt in particular on antenatal syphilis and antenatal tuberculosis as subjects that required elucidation. He was, indeed, one of the first to point out clearly that, although pregnancy is a normal process, it is one that is conducted under physiological stress and in connexion with which disturbances of a pathological nature form proper material for the earliest possible investigation. The lessons which he inculcated are now acted upon, and the importance of a regular watch over pregnancy is no longer dismissed with a few words of advice from the teachers in the schools, but periodical examinations of the pregnant woman are recognised as being the supreme way in which signs of abnormality can be studied and dealt with at a remediable stage. Until this fact became common experience antenatal care was regarded lightly; to-day it is known that there is a direct relation between the experience of the midwife as regards antenatal work and the number of medical aid notices which are sent during labour—a practical proof of the value of antenatal observation. Like many pioneers Routh was supposed to be over-enthusiastic as to the merits of such observation, but no one can read the collection of essays that were brought together recently in an extra number of THE LANCET (Modern Methods in Abnormal and Difficult Labour) without seeing how steadily the estimation of antenatal care has risen in the minds of all who are concerned practically with the problems of pregnancy and labour. Repeatedly the comment is made in these essays, when dealing with the various phenomena and complications of abnormal and difficult labour, that the risks and troubles would have been precluded by antenatal care, and every hospital through its obstetric departments now takes up this attitude. Routh was a pioneer in this important work.

Routh was, also, specially interested in the association of syphilis and marriage, as the cause of more individual and social national trouble than any other disease affecting family life. The last important paper published in our columns from his pen—a communication made previously to the Society for the Study of Venereal Disease—dealt with this subject at length, and showed how long it had been under his consideration. Five years previously he had drawn attention in our columns to the probability that during pregnancy the treatment of a congenitally syphilitic child if properly undertaken is attended with remarkable success, whereas treatment of the same children begun only after birth will be given at a time when the latent period is over and is apt to prove unsatisfactory. His later communication justified his premises.

To return to Amand Routh's official career, he joined the original Obstetrical Society of London immediately after graduation, was elected F.R.C.P. in 1900, and became in due course a member of the council of the Society, librarian, secretary, and vice-president; in 1911, after the incorporation of the old Society with the Royal Society of Medicine, he was made President of the Section of Obstetrics and Gynæcology. Here his introductory and retiring presidential addresses struck a modern note, for he pointed out the need for advance in biological research as regards chemical, physiological, and pathological problems involved in the processes of menstruation, labour, lactation, and also the toxæmias of pregnancy. When President of the Harveian Society, as in the proceedings before the Royal Society of Medicine, he made valuable observations upon antenatal syphilis and the results of latent syphilis during pregnancy, offering suggestions which have since been confirmed in many directions. He was much in request as an examiner, discharging these functions at the English Conjoint Board, and also at the Universities of London, Birmingham, and Cambridge. In the University of London he was a member of the Standing Committee of Convocation for some 20 years—that is, until his retirement in 1923, and for a long portion of this period he sat on the Board of Advanced Medical Studies.

Routh was a prominent member of the Church of England, and was churchwarden at St. Paul's, Portman-square, for nearly 20 years; no doubt his religious feelings played a part in his attitude towards artificial birth control, save under medical advice, and many of similar views to his own found his arguments for the spacing of the arrival of children by self-control and abstinence to be a satisfactory substitute for mechanical methods of contraception. He was also a prominent Freemason, and after retirement to Folkestone became prominently associated with the civil activities of the borough. In his youth he had been a successful athlete, and until late middle life was an enthusiastic golfer.

This, it will be seen, is a record of a long life spent not only in intensive investigations along special lines but in bringing the resulting work into relation with all medicine and all society.

RINGER SOCIETY: THE ANNUAL DINNER.—The first annual dinner of this society was held on Dec. 10th at Jules Restaurant. The President, Dr. Henry Ellis, took the chair, and in the presence of a large company of guests delivered the Ringer oration. He explained that the society was named after Sydney Ringer, one of the first clinicians to realise the value of physiology and biochemistry applied to practical medicine, and perhaps best remembered by his perfusion experiments with the fluid which bore his name. The council of the society, said the President, had been actively engaged in formulating standards of urinary analysis, and these were almost complete. In the coming year the society would proceed to define standards for blood in the same way. Prof. Hugh MacLean, in response to the toast of Clinical Biochemistry, said he was much interested in the evidence presented of the activities of the new society. The health of the guests was proposed by Dr. Halls Dally, and Prof. Joseph Barcroft responded. Prof. F. G. Hobday, in thanking the society for its hospitality, said that he was confident that the coöperation of veterinarians would be very useful. Animals could be most advantageously used in the study of the effects of diet on metabolism. Dr. Langdon Brown and Dr. C. M. Wilson also replied and expressed optimism about the future of biochemistry applied clinically in the way advocated by the society. The health of the President was proposed by Dr. David Barcroft.

Medical News.

UNIVERSITY OF OXFORD.—At a congregation held on Dec. 17th the following degrees were conferred:—

D.M.—Sibyl Eastwood.

B.M.—H. A. Byworth, L. W. H. Bertie, H. P. Gilding, A. W. Cubitt, A. P. Kingsley, and R. E. Havard.

The Francis Gotch Memorial Prize in Physiology has been awarded to Mr. John Carew Eccles, M.B., who has also been elected to a Junior Research Fellowship at Exeter College. Dr. Eccles, who is a Rhodes Scholar from the University of Melbourne, obtained a first class in the Honour School of Physiology and was elected Christopher Welch Scholar in Biology this year.

UNIVERSITY OF CAMBRIDGE.—At a congregation held on Dec. 10th the following degrees were conferred:—

M.B. and B.Chir.—I. A. Jackson, B. W. S. Mackenzie, and W. E. Chiesman.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on Dec. 14th the title of emeritus professor of pathology was conferred on Sir Frederick Andrewes, F.R.S., who, in July, 1927, retired from the University professorship of pathology tenable at St. Bartholomew's Hospital Medical College. The degree of D.Sc. has been conferred on Mr. F. C. Minett for a thesis on the Standardisation of Immune Serum and the Nature of Immunity in Foot-and-Mouth Disease, and other papers. Lord Dawson was appointed as the University's representative at the tercentenary celebrations in honour of William Harvey, patron of the Royal College of Physicians, to be held in May, 1928.

At examinations held recently the following candidates were successful:—

THIRD (M.B., B.S.) EXAMINATION FOR MEDICAL DEGREES.

Honours.—Russell C. Brock (*a*, *d*), Nils L. B. V. Eckhoff (*d*), and Arthur B. Hyman (*b*), Guy's Hosp.; Robin S. Pilcher (*a*, *d*, *e*, University Medal), Univ. Coll. Hosp.; Kenneth H. Watkins (*a*, *d*), Univ. of Manchester.

(*a*) Distinguished in Medicine. (*b*) Distinguished in Pathology. (*d*) Distinguished in Surgery. (*e*) Distinguished in Midwifery.

Pass.—Chandumal A. Amesur, St. Thomas's Hosp.; Vernon F. Anderson, Westminster Hosp.; William A. Ball, King's Coll. Hosp.; Benjamin Barling, Univ. Coll. Hosp.; Philip Berry and Lascelles R. B. Birt, Guy's Hosp.; James W. Bottoms, London Hosp.; Roger V. Bowles, Univ. Coll. Hosp.; Frank W. Bradley, Guy's Hosp.; Doris E. Bunbury, London Sch. of Med. for Women; Maurice R. Burke, St. George's Hosp.; Isabella M. G. Butler, Univ. Coll. Hosp.; John C. D. Carothers, St. Thomas's Hosp.; Phyllys P. Case, Charing Cross Hosp.; John A. Cholmeley, St. Bart.'s Hosp.; Maneckjee M. Cowasjee, Guy's Hosp., Frank H. N. Cruchley, London Hosp.; Rupert P. P. Davies, St. George's Hosp.; Douglas A. Dewhirst, St. Bart.'s Hosp.; Hugh A. Dunlop, Westminster Hosp.; Phyllis M. Edgar, Univ. Coll. Hosp.; Donald C. McC. Ettles, Guy's Hosp.; Libero Fatti, Univ. Coll. Hosp.; Roy R. Fells and James R. Forrest, St. Bart.'s Hosp.; Isabella Forshall, London Sch. of Med. for Women; Krishnalal T. Gajjar, Univ. Coll. Hosp.; Helena M. Gambrell, London Sch. of Med. for Women; Dorothy Godden, London Sch. of Med. for Women and St. Mary's Hosp.; Abraham Golombek, King's Coll. Hosp.; Helen R. Goodman, London Sch. of Med. for Women; Sydney W. Hardwick and Gwilym E. Harries, St. Bart.'s Hosp.; Catherine M. Hext, London Hosp.; Sydney L. Hicks; Univ. Coll. Hosp.; John W. O. Holmes, St. Bart.'s Hosp.; Isabel E. S. James and Arthur W. Kendall, King's Coll. Hosp.; Ambrose J. King, London Hosp.; Eileen M. King, Univ. Coll. Hosp.; John G. Kingsbury, Guy's Hosp.; Caroline M. Kingsmill, London Sch. of Med. for Women and St. Mary's Hosp.; Frank E. Kingston, London Hosp.; Kenneth H. Lachlan, Westminster Hosp.; Richard A. V. Lewys-Lloyd, St. Bart.'s Hosp.; Isabella L. H. Livingstone, King's Coll. Hosp.; Lewis J. McGregor, St. Thomas's Hosp.; Robert M. Maher, Univ. of Liverpool; Hugh L. Marriott, Middlesex Hosp.; Swithin P. Meadows, Univ. of Liverpool; Roy L. Midgley, Univ. Coll. Hosp.; William S. Morgan, St. Bart.'s Hosp.; Leonard Moss and Mark A. Nicholson, London Hosp.; William D. Nicol, St. Bart.'s Hosp.; Ethel E. M. Ogilvie, London Sch. of Med. for Women; Nathoobhai D. Patel, Univ. Coll. Hosp.; Reginald T. Payne, St. Bart.'s Hosp.; Kudatelagé R. T. Peiris, King's Coll. Hosp.; Ethel E. A. Pepper, London Sch. of Med. for Women; Gangadhar M. Phadke, Univ. Coll. Hosp.; Leonard G. J. Pitt-Payne, Guy's Hosp.; Max M. Posel and Evan R. Rees, St. Bart.'s Hosp.; Elsie E. A. Ridley, London Sch. of Med. for Women; Muriel Rippin, Univ. Coll. Hosp.; Edward H. Roche, Guy's Hosp.; James E. C. Rouse, St. George's Hosp.; Brian F. Russell, London Hosp.; Margaret V. Saul, King's Coll. Hosp.; William D. Sheldrake, Guy's Hosp.; Eric W. Skipper, London Hosp.; Hilda W. Slack, London Sch. of Med. for Women; William R. C. Spicer, Guy's Hosp.; Olive F. Sydenham, Univ. of Birmingham; Victoria W. Symonds and Dorothy Taylor, St. Mary's Hosp.; Kathleen A. Vernon, London Sch. of Med. for Women; Richard F. Ward, London Hosp.; John G. Weston, Guy's Hosp.; Dorothy M. Wilkins, London Sch. of Med. for Women; Michael C. Wilkinson, St. Thomas's Hosp.; John E. B. Williams, Univ. Coll. Hosp.; Elsie B. Wright, London Sch. of Med. for Women; and Harry D. Wyse, Guy's Hosp.

UNIVERSITY OF MANCHESTER.—At recent examinations the following candidates were successful:—

Final M.B., Ch.B.—R. S. Abraham, S. K. Appleton, Soloman Bernstein, Agnes N. Buckley, Eric Cretney, E. B. Davies, D. E. Francis, Dorothy Guest, Amy H. Herbert, G. D. Hithersay, J. H. Jones, James Kemp, Kathleen McGowan, Jean McD. Marshall, H. E. Martin, J. R. Nuttall, Nora Ridehalgh, Lucy Stokoe, C. E. Sykes, and Joseph Vine.

Forensic Medicine.—E. H. Brooks and J. A. Longworth.

Hygiene and Preventive Medicine.—Doris Bernard, E. H. Brooks, Mary G. Davies, G. B. Hardman, E. P. Johnson, J. A. Longworth, and J. W. Murray.

Obstetrics and Surgery.—G. L. Brown, D. E. Francis, Alexandra W. Groves, I. M. Hughes, Morris Levine, Kathleen McGowan, J. S. Miller, E. J. B. Sewell, Henry Tickle, and J. F. Wilkinson.

Obstetrics.—Stanley Nowell.

UNIVERSITY OF EDINBURGH.—At a graduation ceremonial held on Dec. 16th the following degrees and diplomas were conferred:—

M.D.—E. W. Anderson, M. J. Bett, †George Brewster, ‡J. C. B. Craig, ‡Sidney E. Croskery, †D. M. Dunlop, H. J. C. Durward, J. F. Fraser, I. M. D. Grieve, H. H. Holden, G. J. Hughes, ‡D. J. A. Kerr, *J. G. Kininmonth, Helen M. Russell, H. T. Smith, †Donald Stewart, and †David Wilkie.

Ch.M.—‡A. L. M'Gregor.

M.B., Ch.B.—C. H. B. Adamson, H. J. van den Berg, A. G. Bonnyman, K. V. R. Choudari, Bessie L. Clark, A. J. Clements, Bernard Cohen, J. L. Cowan, T. A. Edwards, E. A. Fergusson, Jessie D. Forrester, James Fraser, L. M. E. R. Henshaw, W. H. Houghton, Samuel Jesudasen, W. H. E. Johnson, F. M. Khan, Joseph Kingsley, A. A. MacArthur, J. W. B. Macdonald, A. E. Mackintosh, Kenneth M'Neill, A. G. R. Macpherson, A. W. MacQuarrie, F. F. Main, Richard Mennie, W. M. Mitchell, W. D. Moore, J. S. R. Pandit, W. H. D. Patterson, P. J. G. Payne, Frances M. Porter, L. L. Ratazzi, A. S. Reilly, R. H. Robertson, J. M. Russell, B. S. Sandhu, Margaret A. Spencer, E. R. Thomson, E. W. T. Webber, and Elisabeth M. Williams.

D.P.H.—Margaret A. Mackenzie.

* Awarded gold medal for thesis.

† Highly commended for thesis. ‡ Commended for thesis.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—The College will be closed from to-day (Friday) Dec. 23rd, until Saturday, Dec. 31st, both days inclusive.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—The December meeting will not take place and the next meeting will be held on Wednesday, Jan. 25th. Sir John Bland-Sutton will deliver the Annual Oration on May 23rd, his subject being the Debt of Dermatology to Optical Glass.

ROYAL INSTITUTION OF GREAT BRITAIN.—Two lectures on the Physiological Aspects of Flying will be delivered by Group-Captain Martin Flack, Director of Medical Research in the Royal Air Force Medical Service, at 5.15 P.M. on Thursdays, March 22nd and 29th. On March 2nd Sir Farquhar Buzzard will give a Friday evening discourse on the Psychology of the Sick.

PORTRAIT OF THE LATE DR. ADAMI.—A portrait of the late Dr. J. G. Adami, Vice-Chancellor of the University of Liverpool, has been hung in the Assembly Hall of the medical building at McGill University, Montreal, where Dr. Adami was for many years professor of pathology. The portrait was subscribed for by Dr. Adami's many friends, pupils, and former assistants.

CHELSEA HOSPITAL FOR WOMEN.—This hospital of 97 beds is doing double its former work with no increase in the number of its voluntary supporters, and a special appeal is being made for the purchase of radium. A floor of 18 beds is reserved for patients able to pay five guineas a week and small fees to the staff for operations.

NEW RULES AT A BIRMINGHAM HOSPITAL.—The Birmingham and Midland Ear and Throat Hospital has made a rule that the honorary and assistant surgeons shall not hold an appointment at any other hospital, on the ground that duplicate appointments militate against the adequate performance of their duties. In consequence of the establishment of the hospital contributory scheme tickets for this hospital have been abolished.

BRITISH CHARITIES ASSOCIATION.—Lord Knutsford, who presided at the fourth annual meeting of the British Charities Association held at Kingsway House, W.C., on Dec. 15th, stated that the activities of the Association had resulted in a surplus for the year of £18,150, being an increase of over £4000 on the previous year's figure. Distributions to voluntary hospitals during the year amounted to £20,600, and since the close of the year the Council have made further grants of £15,000 to King Edward's Hospital Fund for London and £5000 to the League of Mercy. The total distributions since the formation of the Association four years ago now exceed £173,700. In announcing the Association's latest prize competition, consisting of a Bovril Slogan Ballot, with £6000 in prizes presented by Bovril,

Ltd., the chairman invited all voluntary hospitals to coöperate by availing themselves of the offer of tickets, which the Association issues, free of cost, to any voluntary hospital for sale on behalf of its own funds.

Appointments.

LYONS, LESLIE, L.D.S. R.C.S. Eng., has been appointed Clinical Assistant in the Dental Department of King's College Hospital, Denmark Hill, S.E.

Queen Charlotte's Maternity Hospital: PEIRCE, G. E. G., M.B., B.S., Senior Resident Medical Officer; ROSS, G. A., M.B., Ch.B., Assistant Resident Medical Officer.

University of Manchester: HILL, E. F., M.B., Ch.B. Manch., Lecturer in Anæsthetics; WRIGLEY, F. G., M.D. Manch., Lecturer in Diseases of the Throat and Nose; COOPER, E. R. A., M.D. Manch., Lecturer in Histology; HOWE, F., M.B., Ch.B. Manch., Demonstrator in Anatomy.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Hospital for Sick Children.—Lady Supt.
Aberdeen Royal Infirmary.—Hon. Jun. Asst. Ophth. S.
Argyle and Bute District Memorial Hospital, Lochgilphead.—Asst. M.O. £300.
Bermondsey, Borough of.—Asst. M.O. for Maternity and Child Welfare. £600.
Birmingham Pensions Hospitals Committee.—Jun. Surg. O. £300.
Blackburn and East Lancashire Royal Infirmary.—3rd H.S. £150.
Coventry and Warwickshire Hospital.—Res. H.S. £125.
Derby, Derbyshire Royal Infirmary.—Hon. Gynæcologist.
Durham, Seaham Hall Sanatorium.—Med. Supt. £600.
Guildford Union.—Res. Asst. M.O. £150.
Hackney Hospital, High Street, Homerton, E.—Jun. Asst. M.O. £350.
Hendon Union, Redhill Hospital, Edgware.—Res. Deputy Med. Supt. £300.
Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—Hon. Asst. P.
Hull Royal Infirmary.—Second H.S. At rate of £150.
Lincoln, The Lawn.—Med. Supt. £700.
London School of Hygiene and Tropical Medicine, University Chair of Public Health.—£1300.
Manchester Royal Infirmary, Central Branch, Roby-street.—Jun. H.S. £100.
Nottingham City Board of Guardians.—Dist. M.O.
Northampton, Creaton Sanatorium.—Med. Supt. £550.
Nottingham General Hospital.—H.S. At rate of £150.
Portsmouth, St. Mary's Infirmary, &c.—Third Asst. Res. M.O. £250.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Anæsthetist.
Royal Army Medical Corps.—Limited number of Commissions.
St. Paul's Hospital for Diseases of the Genito-Urinary Organs and Skin, Endell-street, W.C.—Res. M.O. At rate of £200.
Sheffield, Jessop Hospital for Women.—Two Asst. H.S.'s. At rate of £100.
Wakefield, West Riding Mental Hospital.—Jun. Asst. M.O. £400.
Willesden General Hospital, Harlesden-road, N.W.—H.S. At rate of £100.

Births, Marriages, and Deaths.

BIRTHS.

CROSBIE.—On Dec. 10th, at Beaufort House, Ealing, the wife of Dr. Frank Crosbie, of twin sons.
NEELY.—On Dec. 18th, at Vernon House, Lee-road, Blackheath, the wife of Dr. Guy Neely, of a daughter.
VEVERS.—On Nov. 22nd, at "Lavalance" Nursing Home, Bordeaux, the wife of Oswald H. Vevers, M.R.C.S., L.R.C.P. Lond., of Villa Beaugeard, Arcachon, of a son.

MARRIAGES.

CALDWELL—HILL.—On Dec. 17th, at St. Columba's Church, London, Dr. Robert Stevenson Caldwell, of New Milton, to Stephanie Winifred Hill.

DEATHS.

COSSHAM.—On Dec. 14th, at Wellesley House, Cirencester, William Raymond Cossham, M.D., aged 76 years.
FIELD.—On Dec. 9th, at Falmouth, Cornwall, Albert Frederick Field, M.D., late St. Bartholomew's Hospital, aged 83.
GRESSWELL.—On Dec. 14th, aged 71 years, Albert Gresswell, M.A., M.D. Oxf., St. Bart.'s, of Kelsey House, Louth, Lincs.
GROOME.—On Dec. 14th, at Finborough, Suffolk, William Wollaston Groome, M.D., aged 74.
ROUTH.—On Dec. 18th, at his residence, Grimston Court, Folkestone, Amand Jules McConnel Routh, M.D., F.R.C.P.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE ROMANCE OF LONDON'S WATER-SUPPLY.

AT Islington, near the Agricultural Hall, stands a memorial to Sir Hugh Myddleton, who led pure water to London from the springs of Chadwell and Amwell, tributaries of the New River, over 300 years ago, just before Harvey discovered the circulation of the blood. Since then London's water-supply has continually expanded and improved, and every day 7 millions of citizens use on an average 37 gallons each of water which for chemical and bacterial purity is unsurpassed. One remarkable thing about the engineering marvels of the Water Board is their extreme unobtrusiveness. Both the proposer and the seconder of a vote of thanks to Sir Alexander Houston for an illuminating lecture on this subject, delivered at the Royal Society of Medicine's social evening on Dec. 14th, admitted that the bulk of what he had said had been absolutely new to them, and their ignorance must be representative of that of most of London's population. Probably few citizens could name the principal reservoirs in which their drinking-water is stored, nor enumerate the steps taken to purify it. Actually the list is so long that it would tax an ordinary memory, for there are no less than 49 storage reservoirs, with a total area of 2704 acres and a content of 19,657 millions of gallons, enough to supply London for 80 days. The Thames water is stored at Staines, Walton, Hampton, and Hammersmith, and makes up 60 per cent. of the total supply. The remainder comes from the New River, the Lea, and deep wells in the Kentish chalk.

Thames water is purified by storage, sand filtration, and chlorination, said Sir Alexander Houston, but storage alone is a most effective means of purification. Suspended matter is precipitated and organic matter is decomposed; good and bad water are mixed, to the benefit of the mixture, and undesirable bacteria lose their vitality, so that adequate storage is nearly equivalent to sterilisation. The length of time at the Chelsea reservoir is 15 days, and this reduces the colon bacillus content to one-hundredth. The chemical improvement that results from storage alone is equally striking; great reduction takes place in the turbidity and ammoniacal nitrogen content, and, in lesser degree, in the percentage of albuminoid nitrogen. A disadvantage of storage is, however, the encouragement it gives to the growth of algæ; these bodies sometimes multiply to such a formidable extent that they not only give an unpleasant taste to the water but interfere with the working of the filters. Sir Alexander Houston showed several microphotographs of these harmless but troublesome organisms, which are controlled by means of minute quantities of copper sulphate. The rate of filtration is very slow, about 2 gallons per square foot per hour, a movement equivalent to that of the point of the minute hand of a watch. The depth of water on the bed is about 4 feet, and the bed itself consists of 3 feet of fine sand, 12 inches of coarse sand, 9 inches of fine gravel, and 9 more of coarse gravel. Every two or three months the bed has to be cleaned; the water is run off and the sand collected into heaps and washed. Filtration reduces the colon bacillus content from 1000 colonies in 100 c.cm. to one each in 75 per cent. of the samples and none in the remainder.

Chlorination was introduced in 1916 as a war economy, but was actually more effective in destroying bacteria than prolonged storage. Sir Alexander Houston, who was the first to use the method in this country, showed a picture of an improvised apparatus consisting of a number of earthenware jars fed by a man with a jug, and in contrast to this some of the latest models of chlorination were shown in operation in the library. The dose is very small; one-half of a part to a million for Thames water and one-quarter for Lea water. The Lea, as the lecturer reminded his audience, was the river so beloved of the great Isaak Walton. It rises near Dunstable and flows into the Thames near the East End of London, and the reservoirs at Chingford and Walthamstow hold 3000 and 2000 million gallons respectively.

Apart from the service they render Londoners in supplying unlimited fresh water, these great artificial lakes harbour innumerable rare wild fowl on the islands with which they are dotted, for no shooting is permitted over them. Sir Alexander Houston remarked that he had seen 24 heron in the air at once, startled by a gun fired on the neighbouring marshes, and ended his lecture with a splendid photograph of a great crested grebe on her nest, taken less than 5 miles from Henrietta-street.

Dr. Joseph Clarke McPherson, senior medical officer, has been appointed by the King an Official Member of the Executive Council of the Presidency of Montserrat.

A HOSPITAL IN ICELAND.

THE foundation-stone of a new national hospital at Reykjavik was laid in 1926 by the Queen of Iceland and Denmark, and the accompanying photograph, which was taken some months ago, shows the hospital with its roof completed. The flags were placed on the roof by the workmen in accordance with a national custom. As soon as the timbers are in place the proprietor of the building is expected to entertain the builders, and it is said that the flags would not be removed should he fail to do so. The hospital will be heated throughout by water from a natural hot spring.

The National Hospital, Iceland.

ABORTING VENEREAL DISEASE IN INDIA.

STATISTICS of immediate prophylactic treatment suggest that this method has value in the prevention of venereal disease, though results are far from uniform. The essentials to success appear to be conviction on the part of the responsible medical officer, detailed supervision, availability of treatment very soon after risk, and a suitable position for the ablution room. Information on these and other points is accumulating. Thus the 1924 Report on the Health of the Army noted the opening of a central ablution room at Quetta, where out of 4788 men treated in ten months only two had developed disease. Brevet-Colonel A. H. Safford and Major R. C. Paris give further details in the *Journal of the R.A.M.C.* for November. The room is adjacent to the main infecting area, in a recess just off the direct road back to barracks. Free use is made of it, the authors state, if it is open from 2 P.M. until men are due back to barracks, if it is kept scrupulously clean and bright by two specially selected orderlies, if no names are taken and only numbered tallies given, and if the specialist officer keeps the service always on the highest level. In three years among 16,000 men who used the room only one case of syphilis developed, seven of soft chancre, and 27 of gonorrhœa. Before this room was opened venereal incidence in Quetta was the same as in all India; now it is only one-half. In India the home prophylactic packets began to be issued in May, 1925; the rate for admission to hospital on account of venereal disease fell from 75 in 1924 to 72 in 1925, and to 62 in 1926. Experience of prophylactic measures in the American Expeditionary Force is recorded in a review on p. 1241 of our issue of Dec. 10th.

ARTIFICIAL DEFORMATION OF THE SKULL.

To the Editor of THE LANCET.

SIR,—My attention has been called to an article with the above title in THE LANCET of Nov. 5th (p. 1001) by Mr. Warren R. Dawson, in which the writer draws conclusions as to the origin of the practice of artificial deformation of the skull in Egypt from what he honestly believes to be evidence for such a custom, but which, unfortunately, as will be seen, is only evidence of the way in which facts may be distorted to suit the purposes of persons more interested in making a story than in truth.

The skull upon which Mr. Dawson bases his suggestion was found by Dr. L. Gatineau in a Coptic cemetery of about the fifth century A.D., at Medall, near Faehn, about 100 miles from Cairo. It was brought to Cairo and subsequently was stated to have come from Tell-el-Amarna, nearly 100 miles further south, from the ruins of the town of Akhenaten. Dr. Gorgy Sobhy, on the strength of this statement, and from the *seeming* resemblance of the skull in shape to the heads of Akhenaten, his daughters and other people represented on the monuments and in the statues of the period, examined and measured the skull but made no restoration of it. He, however, gave it as his belief that it belonged to a female member of the family of Akhenaten, and published his account in the *Bulletin de l'Institut Français*, t. xiv., with photographs both of the skull and of a wax model made by Dr. Gatineau, to represent what he imagined would be the appearance of a woman with a skull of this shape. If, however, the skull and model are examined, it will be seen that while the model resembles the stone heads from Tell-el-Amarna, it in no way agrees with the skull upon whose shape it is supposed to be based. The peculiarities of the deformed skull, due to the method of bandaging which has been employed to distort it, are its length, narrowness, and height, whereas the statues are remarkable for their width and flatness, as are also the actual skulls of both Akhenaten and Tut-ankh-Amen.

The skull is undoubtedly an example of artificial deformation by bandaging, and the fact that it was taken from a Christian cemetery lends colour to my suggestion that the girl was a visitor to Egypt from the Caucasus, where the practice is, I am told, still in vogue.

In the year 1923, hearing that Dr. Gatineau was selling his effects, I bought the skull and wax model and took them to London. They were purchased for the Museum of the Royal College of Surgeons, where they may be seen.

In the meantime Dr. Gatineau had himself published a short note of his excavations at Medall, and in this he gives photographs of some of the skulls found there which he calls "Crânes de martyrs Coptes chrétiens," and includes in Fig. 2 of his paper the photograph of the skull already described and published in 1918 as coming from Tell-el-Amarna! As I write I have in front of me the two papers, in each of which the same photograph appears, the one in Dr. Gatineau's paper, labelled fifth century A.D., and its provenance given as Medall, the other paper, that of Dr. Sobhy, describing the skull as that of a member of the family of Akhenaten, whose town lies 100 miles south of Medall and whose date is some eighteen hundred years earlier! On making this discovery I communicated with Dr. Sobhy, who thereupon published a correction in the *Journal of Egyptian Archæology*, vol. ix., p. 117. This correction Mr. Dawson has unfortunately not seen.[1]

In the whole of my experience in Egypt, where I have seen and handled many thousands of crania of all dates, I have never come across another example of deformation by bandaging, and it may be taken as certain that the custom did not have its origin in Egypt nor was practised in this country. Mr. Dawson's own quotation from Hippocrates, who describes the custom as performed in his day in Asia Minor, is surely evidence in itself that nothing was known of it in Egypt or Hippocrates could scarcely have failed to mention it. I am, Sir, yours faithfully,

DOUGLAS E. DERRY.

Anatomy Department, Egyptian University, Cairo, Nov. 25th, 1927.

TRADE DIARIES AND CALENDARS.

THE Anglo-French Drug Company (238A, Gray's Inn-road, London, W.C. 1) have sent us a copy of their block diary for 1928 measuring 6 in. by 4¼ in. and showing a page to a day. It makes a convenient desk companion and the inside of the front cover holds a concise list of the pharmaceutical products of the firm.—From Messrs. Oppenheimer, Son and Company, Ltd. (179, Queen Victoria-street, London, E.C. 4) we have received a copy of their new edition of Ephemeris Pharmacologica, which is in the form of a pocket diary and contains an almanac and a visiting-list with blank pages for memoranda and addresses. In addition to brief therapeutic notes on drugs and other pharmaceutical products useful information is given on poisons and antidotes, drugs and their doses, infectious diseases, heights and weights, and so forth. Both these publications are obtainable on application.

[1] But see Mr. Dawson's letter in THE LANCET of Nov. 26th, p. 1166.—ED. L.